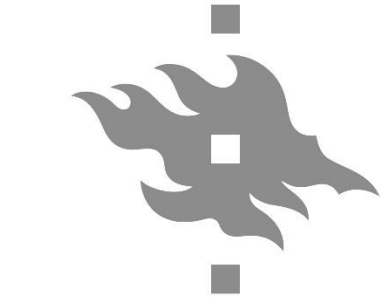

UNIVERSITY OF HELSINKI

Master's Thesis

Regional Studies

Urban Geography

Towards a More Comprehensive Picture of Mobility – Personal Preferences, Resources and Constraints of Daily Travel

Salla Kuisma

2017

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Title – Työn nimi
Towards a More Comprehensive Picture of Mobility – Personal Preferences, Resources and Constraints of Daily Travel

Subject – Oppiaine
Urban Geography

Level – Työn laji	Month and Year – Aika	Number of Pages – Sivumäärä
Master's thesis	November 2017	78 + appendices

Abstract – Tiivistelmä

Changes in the transport environment and the resulting need to manage transport demand require a better understanding of travel behaviour. The concept of mobility is defined as the potential for movement, and is well suited to this purpose. However, despite the definition, mobility has usually been measured in terms of realized travel indicators (descriptive data of past travel), because potential for movement is hard to capture.

To make mobility easier to approach in practice, this work elaborates the mobility concept, describes a conceptual model for it, and implements a more comprehensive approach to it through a survey. The work was done in two parts: 1) The multidisciplinary literature was reviewed, and three specialists were interviewed to construct a conceptual mobility model that specifies the relevant factors comprising mobility. 2) A survey on daily travel was conducted in five Finnish cities. The survey focused on three issues of mobility: personal travel preferences (in terms of features), resources and experienced constraints.

The results show that mobility is an amalgam of personal variables (background, life situation, personality, identity, preferences, needs, resources and routines), situation-specific and environment-related factors, decision-making processes, and realized travel. These are specified in the mobility model.

The survey results show that when respondents were asked to rate sixteen travel features in terms of importance, those valued the highest on average were reliability, rapidity and freedom from transport timetables. The features were valued differently depending on the trip. On a grocery store trip, for example, reliability was not as important as on work or leisure activity trips, whereas boot space for goods was considered essential. Active users of cars, public transport and bicycles had different priorities than their non-active counterparts. Car drivers appreciated the rapidity, reliability, freedom from transport timetables, possibility to drive, avoiding walking, convenient boot space, privacy, and avoiding changing vehicles and going outdoors in bad weather, afforded by their vehicle. Users of public transport valued its environmental friendliness, low cost, possibility to focus elsewhere than on driving, and physical exercise. Understanding personal preferences has the potential to contribute, among other things, to smarter demand management.

The results also show that over 90% of the respondents experienced some of the six defined constraints on their daily mobility: lack of time, lack of money, low energy or difficulty coping, safety concerns, lack of a suitable vehicle, or physical disability. Low energy or difficulty coping was the most common constraint, with 82% experiencing it at least slightly and 34% quite a lot or very much. The respective figures for lack of time, which was the second most common constraint, were 65% and 32%. The constraints were related to personal variables, which supports earlier findings. The results indicate that the personal-resource perspective can increase our understanding of mobility. In particular, the mental resources needed for travel seem to be a relevant issue in mobility that is rarely considered and therefore requires greater attention.

Keywords – Avainsanat
mobility, transport, travel, travel preferences, travel constraints, personal resources, transport planning

Where deposited – Säilytyspaikka
HELDA

Additional information – Muita tietoja

Tiedekunta/Osasto – Faculty	Laitos – Department
Matemaattis-luonnontieteellinen tiedekunta	Geotieteiden ja maantieteen laitos

Tekijä – Author
Kuisma Salla Kaarina

Työn nimi – Title
Kohti kokonaisvaltaisempaa kuvaa liikkuvuudesta – Päivittäisen liikkumisen henkilökohtaiset preferenssit, resurssit ja rajoitteet

Oppiaine – Subject
Kaupunkimaantiede

Työn laji – Level	Aika– Month and Year	Sivumäärä – Number of Pages
Pro gradu -tutkielma	Marraskuu 2017	78 + liitteet

Tiivistelmä – Abstract

Liikenteen muutokset ja tarve hallita liikenteen kysyntää edellyttävät syvempää ymmärrystä liikkumiskäyttäytymisestä. Liikkuvuuden (*mobility*) käsite määritellään liikkumisen potentiaaliksi, ja se soveltuu hyvin tähän tarkoitukseen. Määritelmästään huolimatta liikkuvuutta mitataan ja arvioidaan yleensä tutkimalla vain toteutunutta liikkumista, koska liikkumisen potentiaalin arviointi on hankalaa.

Tämä työ avaa ja erittelee liikkuvuuden käsitettä, kuvaa sille käsitteellisen mallin ja soveltaa kokonaisvaltaisempaa lähestymistapaa liikkuvuuteen kyselytutkimuksessa. Työ on tehty kahdessa osassa: 1) Monitieteellisen kirjallisuuskatsauksen ja kolmen asiantuntijahaastattelun pohjalta muodostettiin käsitteellinen liikkuvuuden malli, joka identifioi liikkuvuuden olennaiset tekijät. 2) Kyselytutkimus toteutettiin viidessä suomalaisessa kaupungissa. Kysely keskittyi päivittäiseen liikkuvuuteen liittyviin kysymyksiin, erityisesti henkilökohtaisiin preferensseihin, resursseihin ja koettuihin rajoitteisiin.

Tulokset osoittavat, että liikkuvuus koostuu henkilökohtaisista tekijöistä (tausta, elämäntilanne, persoonallisuus, identiteetti, preferenssit, tarpeet, resurssit ja rutiinit), tilanne- ja ympäristösidonnaisista tekijöistä, päätöksentekoprosesseista ja toteutuneesta liikkumisesta. Nämä on eritelty liikkuvuuden mallissa.

Kysetulosten perusteella luotettavuus, nopeus ja vapaus liikennevälineiden aikatauluista olivat vastaajille tärkeimpiä matkustusominaisuuksia, kun heitä pyydettiin arvioimaan kuudentoista ominaisuuden tärkeyttä. Ominaisuuksien tärkeys vaihteli jonkin verran matkasta riippuen. Esimerkiksi ruokaostosmatkalla luotettavuus ei ollut yhtä tärkeää kuin työ- tai harrastusmatkalla, kun tavaratila sen sijaan koettiin hyvin olennaiseksi. Auton, joukkoliikenteen ja polkupyörän aktiivikäyttäjillä oli erilaiset prioriteetit kuin harvemmin kyseisiä kulkutapoja käyttävillä vastaajilla. Aktiiviautoilijat pitivät erityisen tärkeänä nopeutta, luotettavuutta, vapautta aikatauluista, mahdollisuutta ajaa itse, tavaratilaa, yksityisyyttä sekä kävelyn ja huonon sään välttämistä; joukkoliikenteen aktiivikäyttäjät puolestaan arvostivat ympäristöystävällisyyttä, edullisuutta, hyötyliikuntaa ja mahdollisuutta keskittyä matkan aikana muuhun kuin ajamiseen. Henkilökohtaisten preferenssien ymmärtäminen voi mahdollisesti osaltaan edistää älykkäämpää liikenteen kysynnän hallintaa ja palveluiden suunnittelua.

Kyselytuloksista selviää myös, että yli 90 % vastaajista koki jonkin kuudesta määritellystä rajoitteesta vaikuttavan päivittäiseen liikkumiseensa. Tutkitut rajoitteet olivat ajan puute, rahan puute, jaksamisen puute, turvallisuuskysymykset, sopivan kulkuneuvon puute ja fyysiset liikkumisrajoitteet. Jaksamisen puute oli yleisimmin koettu rajoite. Sen koki vähintään hieman päivittäistä liikkumista rajoittavana 82 % vastaajista ja melko tai hyvin rajoittavana 43 %. Vastaavat osuudet ajan puutteelle, joka oli toiseksi yleisin rajoite, olivat 65 % ja 32 %. Rajoitteet olivat yhteydessä henkilökohtaisiin tekijöihin, mikä tukee aiempien tutkimusten tuloksia. Työn tulokset osoittavat, että henkilökohtaisten resurssien tarkastelu on tärkeää liikkuvuuden ymmärtämisessä. Erityisesti henkiset resurssit näyttäisivät olevan merkittävä tekijä liikkuvuuden kannalta, ja siksi siihen tulisi kiinnittää aiempaa enemmän huomiota.

Avainsanat – Keywords
liikkuvuus, liikenne, liikkuminen, liikkumisen preferenssit, liikkumisen rajoitteet, henkilökohtaiset resurssit, liikennesuunnittelu

Säilytyspaikka – Where deposited
HELDA

Muita tietoja – Additional information

Preface

This Master of Science thesis was completed at the University of Helsinki and VTT Technical Research Centre of Finland Ltd. I would like to thank my superiors for providing excellent facilities and support for the work.

First, my sincerest gratitude goes to my thesis supervisor, Satu Innamaa, Principal Scientist at VTT, for enormously valuable advice and encouragement. I would like to thank my supervisors at the university, Tuuli Toivonen and Maria Salonen, for their precious support and guidance during the process. My warmest thanks also go to Pekka Räty, Virpi Pastinen and Pirkko Rämä for giving specialist interviews for this work. I would like to express my deep appreciation of the support provided by our research team leader, Merja Penttinen, and my colleagues at VTT.

I wish to thank Adelaide Lönnberg for her careful correction of my English.

Finally, I would like to thank my friends and family, especially my fiancé Mertsi for love and support.

Helsinki, November 2017

Salla Kuisma

Table of Contents

1. Introduction

1.1. Background

The field of transport is undergoing revolutionary change. New means of owning and using vehicles continue to emerge and will become more widespread in the next few years (Feigon & Murphy 2016; Ministry of Transport and Communications 2016; Tinnilä & Kallio 2015). Car sharing, which enables car usage without private ownership, is one example of this trend. Another example is the discussion around possibilities to provide travel services and vehicles for use in customized packages based on individual demand (e.g. the "Mobility as a Service" concept described by Karlsson et al. (2016) and Rantasila (2015)). The dichotomy between "public" and "private" is morphing into a greater diversity of ownership and collaboration formats (Feigon et al. 2016).

For their part, applications for smartphones and other devices are increasingly shaping travel behaviour (Shaheen et al. 2016). Travel applications offer the consumer a wide range of transportation services, including vehicle routing, real-time transit arrival predictions, real-time data on traffic flow status, information about roadworks and incidents, and information on parking availability (Shaheen et al. 2016). These services are becoming highly popular: according to a recent study conducted in the U.S., 67% of American smartphone owners used their phone for navigation while driving, and 25% used it to get public transport information (Smith et al. 2015). Smartphone apps can make travelling faster, cheaper and smoother (Shaheen et al. 2016); it is hardly surprising, therefore, that people are turning to them to meet their mobility needs. Travel apps shape travel behaviour by reducing the cognitive or physical effort required and giving users greater perceived control over their choices (Shaheen et al. 2016; Korbel et al. 2013).

At the same time, the development of automated vehicles is taking major steps forward (van Arem et al. 2016; Offer 2015). Although it will take some time before fully automated vehicles can enter common traffic, cars already have multiple assistance features that lessen the driver's duties and make driving more effortless. These new vehicles and services together are changing the role of the human as driver and traveller.

Information and communication technologies have certainly made some travel unnecessary, but they also support travelling in various ways. Mobile communications promote a mobile lifestyle, where people can move and access information simultaneously (Lyons & Urry 2005). Besides mobile communication and improved information availability, information and communication technology (ICT) services have affected the use of time spent travelling, and possibly the value of travel time as well (Lyons & Urry 2005). A widening set of activities can be carried out while aboard—not only entertainment or socialising activities, but often working as well. Digitalisation is also fostering the development of new, demand-driven transport services, which creates countless possibilities for travellers (Casey & Valovirta 2016; Ministry of Transport and Communications 2016).

Studies show that travelling continues to be an essential part of our everyday lives in today's societies (Flamm & Kaufmann 2006; Urry 2002). An interesting fact is that even though vehicles have become faster, the time spent travelling has not diminished (Lyons & Urry 2005). Thus, people are travelling further; the annual distance travelled per person has increased substantially (Lyons & Urry 2005).

While the transport environment takes new shapes, a significant change has occurred in transport research and policy: After decades of infrastructure building, maintenance and asset management, the focus has shifted toward management of demand (Carreno & Welsh 2009; Lyons & Urry 2005; Axhausen et al. 2002). This means embracing a better understanding of people's mobility needs and travel behaviour. In transport research, this translates as no longer focusing on minimising travel times or representative day- and peak hours alone; rather, it means understanding the multiple travel patterns and rhythms of daily life more deeply (Lyons & Urry 2005; Axhausen et al. 2002). Demand management-driven transportation policy aims to affect transport demand by changing travel behaviour (Axhausen et al. 2002). Examples of policy tools currently in use include peak pricing, which aims at influencing the activity planning of individuals, or information provision to assist learning of new temporal travel patterns and paths (Axhausen et al. 2002).

Because of unpredictable changes in transport and new demand-focused services and policies, it is crucial to better understand the main factor in transport: individual human beings. Traditional travel research methods that emphasise analysing past trips are no longer enough. For example, common travel surveys focus on collecting descriptive data about travel patterns. The data is used in modelling and predicting future travel and in decision-making processes. But inherent in models and predictions based on realised travel is the

expectation that travel services and behaviour will remain constant over time. A recent report from the Finnish Ministry of Transport and Communications recognises the problem: “Because current travel models are estimated to maintain the status quo, they fit well to stable circumstances and situations where the status quo is well known. If the future is uncertain or major changes occur, models based on the current situation and behaviour will not be usable.” (Free translation, Ministry of Transport and Communications 2016: 3).

Mobility is a concept that reaches beyond visible travel to consider things like travel potential, experience and constraints. Both of the ongoing trends—emergence of new ways to travel and objectives of managing mobility demand—require a deeper understanding of mobility than travel practices in the past and present. Identifying the most important factors and variables of mobility can broaden our understanding of travellers. Focusing on individual resources, constraints, preferences and priorities related to travel can increase our comprehension of travel through the concept of mobility. Understanding the factors behind travel decisions is a fascinating topic that can be profoundly useful in both planning and policymaking.

1.2. Objectives and research questions

This work takes a step towards a more comprehensive understanding of individual mobility and bringing this understanding closer to practice. This is done in two parts: First, the concept of mobility is elaborated from a multidisciplinary approach, and a new mobility model is created in which the most essential factors and components of mobility as travel potential are identified. Second, individual preferences, resources and constraints related to daily travel are surveyed, because they relate closely to mobility but are not commonly studied. The focus of this work is on individual mobility in daily life; non-daily mobility activities like tourism are not dealt with here.

Three things are emphasised here: (1) Mobility is a complex issue that is approached from multiple perspectives in different research fields. A single viewpoint gives a relatively narrow picture of it; thus striving towards a more interdisciplinary discussion is necessary. (2) The work does not focus on trips that have already taken place, but rather on the framework in which they did or did not happen. This framework includes the most relevant factors involved in mobility. It is not restricted to realized travel, because trips that are not made

are relevant to know as well, and they are usually ignored in travel studies focusing on descriptive travel data. Studying personal travel resources and constraints gives us a better idea of the factors that enable and restrict daily travel—in other words make trips happen or not. Studying personal preferences gives us a greater sense of what is important for people when travelling, and on what premises they make their travel decisions. Thus, the perspective is rather from the subjective daily travel experiences of people than from observable travel actions. Understanding individual resources, constraints and preferences shaping mobility takes understanding travel behaviour to a level that is less dependent on a static transport environment. (3) Rather than looking at travel modes alone, this work aims to identify some their most relevant features, such as rapidity or boot space, and to focus on these. In other words, it strives to disassemble travel modes into travel features and study how important people find them, with the understanding that they may vary from trip to trip. I believe that focusing on travel features and their importance to people can increase our understanding of why an individual chooses one travel mode or route over another. In addition, the impacts of new travel modes and services could thus better be estimated as soon as their features are known explicitly enough. Knowing how the features of different travel modes respond to people's mobility needs, preferences and resources will raise new viewpoints and tools for future travel research, planning and policy.

To summarise, the aim of this work is to increase our understanding of mobility and travel by elaborating the mobility concept. This was done by bringing the travel and mobility literature together and interviewing specialists first. The viewpoints of both were then applied to constructing a theoretical mobility model that includes the most relevant identified factors related to individual daily mobility. The purpose of the model is to concretise a complex phenomenon of mobility solidly enough that it can better be considered in future travel research, planning and policy. After construction of the model, individual travel preferences, resources and constraints were explored with a survey. These factors have garnered little attention earlier, but they have a crucial impact on making or not making trips and how they are done in everyday life.

The research questions are as follows:

1) What does mobility consist of?
2) What preferences and priorities do people have in daily travel?
3) Which constraints restrict daily mobility?

These questions were addressed in two phases: The first started with a multidisciplinary literature review on different aspects of travel, the meaning of mobility, and the factors shaping mobility. Following this, three specialists were interviewed especially in relation to more obscure and complex mobility-related issues. Based on the literature review and specialist interviews, a personal mobility model was constructed. In the second phase, a survey was conducted to gain a better understanding of the research questions and mobility as a whole.

2. Theoretical framework and literature review

2.1. Travel as a multidisciplinary field of research

The ability of people to move between locations is essential in the operation of social, economic and practical everyday activities. Transport is defined as a system or means of conveying people or goods from place to place. Travel is defined as the movement of people between geographical locations. Mobility is defined as the ease of movement or the potential for movement (discussed more specifically in chapter 2.2). A trip is travel to a particular place. Transport, travel and mobility link to multiple fields in social, historical, political, economic and environmental dimensions. Accordingly, they are multidisciplinary in nature and are studied from a wide range of perspectives in different fields of research.

Travel has many characteristics, including at least origin, destination, extent (number and length in time or distance), nature (mode, route, timing) and purpose (Rodrique et al. 2017). Passengers have transport requirements on travel time, punctuality or reliability, convenience, transfers, costs, comfort, security, and so forth.

Geography has major relevance for transport systems and travel. On the one hand, distances restrict transport, but on the other, transport would not exist without distances (Rodrique et al 2017). The geography of resources, people and activities is not random but has logic and order that is usually called spatial structure (Rodrique et al. 2017; Anas et al. 1998). The spatial organisation of cities is tightly related to mobility needs, possibilities and constraints.

Travelling is something that happens through space, but it happens through time as well. Swedish geographer Torsten Hägerstrand (1982, 1992) contributed to mobility research by discussing the time-space geographies of everyday life. His work has been continued by many (e.g. Thrift 1996) on space, spatial formations and mobility. Mobility research has become a new topic of active discussion in the field of geography, thanks to the availability of big data. This is used in the study of transport mobility (see e.g. Järv et al. 2014) and individual activity spaces that represent areas of potential travel (Li & Tong 2016).

Travel behaviour studies rooted in psychology and the social sciences have researched the indivisible relationship of abstract constructs, such as attitudes, values, perceptions and desires, to one's travel choices (Paulssen et al. 2014). Qualitative dimensions of travel are traditionally difficult to capture completely (Gudmundsson 2005). The significance of

identity and attitudes in travelling is, however, well recognised by researchers. Paulssen and others (2014) created a travel mode choice model that takes individual's values and attitudes into account. Besides these, at least the effects of attitudes, personality traits, multiple identities, sexuality, and situation-specific aspects on mode choice have been studied (Klein & Smart 2016; Murtagh et al. 2012; Klöckner & Friedrichsmeier 2011; Vredin Johansson et al. 2006). In addition to personal factors, social position has a significant impact on an individual's travel possibilities, and not everyone has equal possibilities to move along transport systems (Martens 2016).

Common travel surveys, models and predictions focus mainly on realised travel. Trips made by individuals are analysed to define travel patterns of people of different age, sex, occupation, income, household type and size, location and type of residential area (e.g. National Travel Survey 2011–2012). The travel patterns are then generalised into the whole population using demographic data (e.g. in Finland: Moilanen et al. 2014; Salomaa 2011). Geographical information can be used in such a way that taking into account the locations of residences, workplaces and other visited places enables the most probable trips and routes to be defined for each individual. These models are based on the measured, realised movement of individuals in the past, demographic information about people, infrastructure, living and land use, and mathematical functions. Calculated future mobility changes in the models are mainly due to changes in demographics, transportation planning and land use.

Clustering people into traveller segments based on demographic information has been done to determine the segments' differences in past travel: number of journeys, length of trips and time used in travel (Tuominen et al. 2007). Traveller segments were created also in an EU-based project called SEGMENT, and were based on travel behaviour and attitudes toward different travel modes (Frost et al. 2013). The travel mode choice of different demographic groups has been studied as well (e.g. Wu et al. 2015), and even predicted by machine learning (Omrani 2015). Stermerding (1996) investigated the possibilities of bringing a feature-specific decision-making aspect to travel studies already 20 years ago by implementing a conjoint method covering travel preferences and mode choice. Similar kinds of methods based on the use of logit models are more widely called choice experiments in travel studies. These have gained prominence lately in response to the emergence of new travel modes (Chen et al. 2016; Mahmoud et al. 2015).

There are multiple aspects to travel; accordingly, different research areas focus on distinct issues. However, communication between the research areas is important to gain as broad

a picture of travel as possible. In policymaking and planning, for instance, this is especially important.

2.2. Mobility concept and theory

The term 'mobility' is often used in common language to simply describe travel. In many cases, mobility is not defined at all. When defined, it has different definitions in different contexts (Carlson & Marchi 2014; Metz 2000). Most definitions agree that mobility is related to movement that happens in some kind of space. The movement can be of people, goods, information, capital or almost anything. It can happen at least in geographical space, social space and virtual space.

In this work, the focus is on human mobility. Human mobility can be divided into two categories: spatial mobility and social mobility (Kellerman 2016; Kaufmann & Montulet 2008). Spatial mobility usually refers to geographical displacement, and social mobility to status transitions of an individual or a group (Kellerman 2016; Kaufmann et al. 2004).

Sometimes, an ambiguous question is whether mobility should be considered as actual movement or the potential for movement. Kellerman (2016: 1) leaves both these options open in his definition: "[H]uman mobility in its most general and basic sense may be referred to as shifting, or the human ability to shift [either spatially or socially]". The Oxford English Dictionary Online (2016) defines mobility generally as "the ability to move or to be moved; capacity for movement or change of place; movableness, portability" and as "ease or freedom of movement; capacity for rapid or comfortable locomotion or travel". To my knowledge, mobility in travel research is most often defined as the ability to move (Hanson 1995), the ease of movement (Sager 2006), or the potential for movement (Spinney et al. 2009; Gudmundsson 2005). It is worth noting (Kellerman 2016; Innamaa et al. 2013) that mobility is still often reduced to only transport or confused with accessibility or efficiency. However, it is more than revealed movement. According to some definitions, it even includes people's preferences of travel, their feelings, and their decisions over time, mode and route (Hakonen 2011; Button et al. 2006; Gudmundsson 2005). Thus, "mobility is not just a matter of where one can travel but also entails the ease of travel. In many cases it is the quality of travel that is important rather than the simple ability to get somewhere." (Button et al. 2006: 19).

Mobility, defined as the ease of movement or the potential for movement, is conditioned based on mobility tools, such as the networks and means of travel one knows about, has access to and is willing to use (Kulmala and Rämä 2010; Spinney et al. 2009). Revealed movement thus happens within mobility (Spinney et al. 2009). In the transport context, this revealed movement is usually denoted as revealed travel (Sager 2006) or as transport mobility that as a concept is based on personal benefits derived from travelling (Spinney et al. 2009). Benefits derived from travelling can be social, emotional, psychological or physical (Metz 2000). The term 'observable travel' has also been used for revealed movement (Kaufmann 2002). Since measuring mobility is a very difficult task, revealed travel or transport mobility is often used as an imperfect measure of mobility (Spinney et al. 2009), even when mobility is defined as travel potential. Accessibility is another mobility-related concept that can be measured. It describes the number of opportunities or activity sites available within a particular travel time or distance (Kellerman 2016; Farrington & Farrington 2005; Sherman et al. 2005). Accessibility thus refers more to places, whereas mobility refers to individual people, their personal experiences and choices. However, accessibility is closely tied to mobility, because accessibility enables people's realised and potential mobility.

The mobility model developed for the TeleFOT project (Innamaa et al. 2013), and used in the Drive C2X project as well (Malone et al. 2014), provides a structure for the transport mobility concept (Figure 1). The model consists of the amount of travel, travel patterns and journey quality. These three elements of transport mobility are further dismantled into more specific branches of elements. Amount of travel consists of the number of journeys, length and duration. Duration is the same thing as time consumed. In travel patterns, element bundle timing, [travel] mode, route and [travelling in] adverse conditions are included. Timing measures on what time of the day trips are made, or on which day of the week, etc. Journey quality in turn contains subjectively experienced elements including user stress, user uncertainty, feeling of safety and feeling of comfort. This model is used as a basis for revealed travel in the mobility model built in this work.

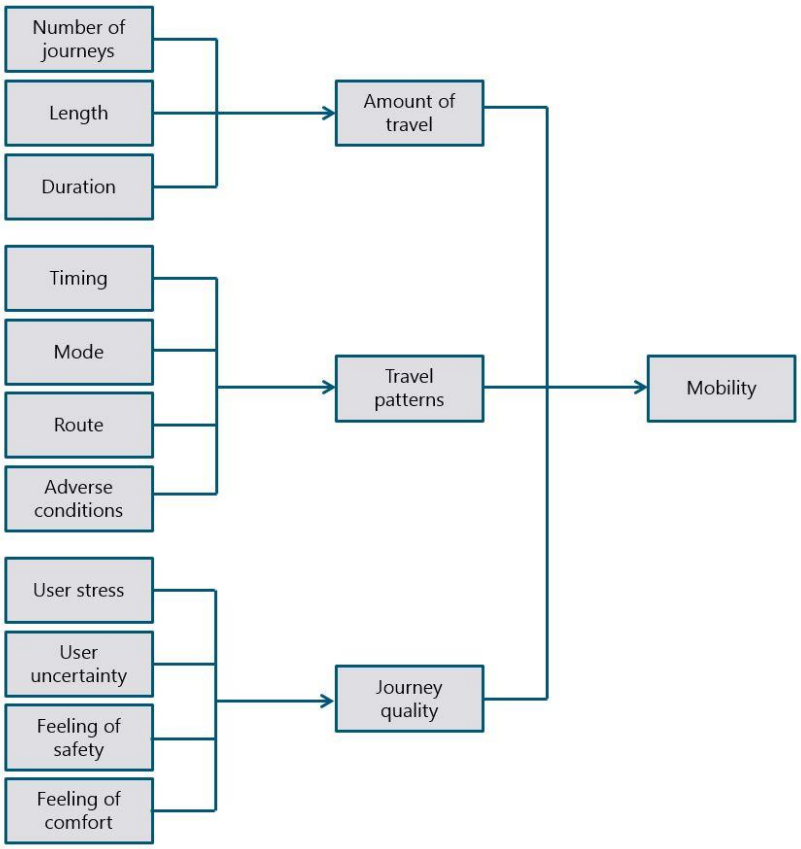

Figure 1. TeleFOT mobility model (Innamaa et al. 2013).

Both personal and external factors affect mobility, whether considering potential or transport mobility. Skills, competence, resources, background and situation in life could be examples of personal factors affecting mobility (Kellerman 2016; Kaufmann 2004). External factors cover all kinds of environmental, social and cultural matters that shape mobility. Also, the causes of mobility are various. On the one hand, mobility may be considered a derived need, since people commonly need to travel in order to participate in activities and events, meet people, see places and gain material or information. On the other hand, mobility can also be seen as a primary need: a human being is naturally curious to visit new places. In addition, people have a biological need related to locomotion, simply to physically move their limbs. The motivations for movement have been categorised into push and pull, where push relates more to primary reasons for moving, and pull to a derived need to move (Kellerman 2016).

It is important to remember that individuals may have different opinions about what trips are feasible (Sager 2006). According to Sager (2006: 483), a distinction could thus be made between subjective and objective mobility: “Subjective mobility takes us inside mental

space." Understanding travel behaviour and decisions indeed requires going inside this "mental space". When mobility is defined as the potential for travel, it could be argued that there is no such thing as objective mobility. My interpretation is that subjective experiences are the one crucial factor in the mobility concept, and thus mobility is always subjective. In turn, realised travel or transport mobility can be measured objectively.

In the social sciences, mobility has a different meaning. Social mobility refers to status transitions of individuals and groups (Kellerman 2016). It links to differences in social achievement according to social background, which relates to theories on social and educational opportunities (Boudon 1984). One dictionary definition of social mobility is "movement of individuals, families, or groups through a system of social hierarchy or stratification" (Encyclopædia Britannica Online 2016).

Mobility is an essential part of late modern societies, enabling a myriad of possibilities that make up our well-being, identities, and the life we know (Freudendal-Pedersen 2009). Social factors, such as background, resources and situation in life, affect spatial mobility. Also personal factors, such as skills and competence shape spatial mobility. Thus, people have different abilities to move. Massey (1994: 149) described this social inequality in mobility as follows: "Different social groups have distinct relationships to this anyway differentiated mobility: some people are more in charge of it than others; some initiate flows and movement, others don't; some are more on the receiving end of it than others; some are effectively imprisoned by it."

Social and spatial mobility are interrelated. Spatiality and spatial restructuring are one area of analysis that has brought out the significance of spatial mobility also in the social sciences (Hannam et al. 2006; Harvey 1989; Soja 1989). All forms of social life involve geographical proximity and distance that necessitate spatial mobility (Urry 2002). Therefore, the ability to move is essential for social intercourse (Carp 1988; Lawton & Nahemow 1973; Irwin 1970). It links people in patterns of desire, obligation and commitment (Urry 2002). Spatial mobility is usually required for one to participate in activities and events, meet people and explore new places. It is, in many cases, a prerequisite to fulfilling daily needs. According to Kellerman (2016), upward social mobility may lead to increased and extended spatial mobility, because one might have enhanced ability to purchase and use different means of transport. The other way round, increased spatial opportunity can mean a rise in social mobility, where one can access more information and the opportunities that stimulate it. It is worth noting, however, that increased realised mobility does not automatically imply a

better life for the individual or the society. Urry (2002: 270) states that "a good society would minimize 'coerced immobility' (as well as the many forms of 'coerced mobility') and maximize the conditions for copresence." In other words, sometimes it is not possible for one to travel, while at other times one is forced to. A discussion on an ideal society is, however, an entirely different issue altogether.

Although virtual services may have reduced the need for spatial mobility in some cases, studies show that the time used for travelling has not diminished (Lyons & Urry 2005). There are occasions on which a virtual presence simply cannot replace a real one. The interrelation of spatial and social mobility is closely related to questions of socio-spatial inequalities and social justice.

Some argue that there is no point separating social from spatial mobility. Kaufmann and others (2002) launched a relatively new alternative concept for potential mobility. This concept is 'motility', and it in a sense combines the meanings of social and spatial mobility. Motility is defined as "the capacity of entities (e.g. goods, information or persons) to be mobile in social and geographic space, or as the way in which entities access and appropriate the capacity for socio-spatial mobility according to their circumstances" (Kaufmann et al. 2004: 750). Motility can be described as potential mobility, or it can be seen as social and spatial mobility combined. Another basis for this concept is that potential mobility can be considered one form of capital (Kaufmann et al. 2002). This makes sense, if we suppose that mobility enables wider opportunities for social, and other, achievement.

According to Kaufmann and others (2004), motility consists of three main components: First is access, which is constrained by time, place and other environmental constraints. Second is competence, which refers to skills and ability. Third is appropriation: how individuals or groups act upon or interpret their access and competences, whether real or perceived.

The criticism that they express towards the original mobility concept is justifiable: geographical mobility and social mobility, which are closely tied to each other, are often inconsistently totally separated without acknowledging the embedded relations. Besides them, at least Urry (2002) has criticised particularly geographers for not being concerned with the social bases of travel. Traditional mobility research has also been criticised as merely describing actual and past fluidity (Kaufmann et al. 2004). However, I argue that the latter is not the fault of the mobility concept itself, but rather of insufficient methods.

The term mobility is used here, because it is widely used and can be dismantled into potential and revealed travel. As an urban geographer, I intend not to ignore the presence and significance of the social aspects of mobility. Still, the focus of this work is not on social mobility but on geographical mobility, which anyway connects tightly to social aspects. That is to say, this work deals with the physical mobility of people in geographical space. Mobility is here defined as the potential for physical travel of people through space and time, and according to the definition, revealed travel happens within mobility.

2.3. Literature on daily mobility-shaping variables

Multiple factors shape mobility. Both personal variables and the environment affect the way one travels and the possibilities for travel. Multidisciplinary literature presents multiple aspects to mobility. The literature introduced here, in addition to the mobility literature introduced in chapter 2.2, constructs the basis for the mobility model in this work.

Demographic and socioeconomic factors are related to realised travel (e.g. Wu et al. 2015; Tuominen et al. 2007). It has been noticed that demographic factors such as sex and age correlate with travel (e.g. National Travel Survey 2010–2011). Socioeconomic factors like income relate to travel also. These factors can create opportunities or restrictions for an individual person's travel. Demographic and socioeconomic factors are related to varying situations in life, which affect all decisions and travel alike. Thus, travel cannot completely be separated from other areas of life, as the mobility concept suggests. The potential for travel derives from various factors, including socioeconomic ones. Interrelation of geographical and social mobility refers to this notion as well.

Needs for mobility are various and individual, and they relate to individuals' situations in life. Kellerman (2016) specifies that mobility is both a derived and a primary need. Mobility is often necessary for people to participate in activities such as grocery shopping, going to work, or meeting other people. In these cases, mobility is a way of meeting other needs in life. At the same time, it is said that humans have a need to be mobile just for the sake of moving. They have a natural craving to move their limbs. In addition, people are curious by nature and eager to seek variety (McAlister & Pessemier 1982), which could be one reason for moving from one place to another. People, however, have needs that do not push for travel or even constrain it. For example, resting and household work typically require staying

at home and possibly take priority over mobility needs. Needs vary by nature and importance and are thus a matter of prioritisation. Not all potential travel is realised.

Demographic and socioeconomic factors are tied to multiple complex social and cultural mechanisms that affect behaviour and decision making. Personal attitudes and values play a big role in travel behaviour (Paulssen et al. 2014; Beirão & Cabral 2007). People also have different lifestyles that define travel behaviour (Salomon & Ben-Akiva 1982). Although attitudes and values, like personality in general, differ from person to person, they are constructed in a social and cultural environment. The relationship of personality and identity to choice of travel mode has been studied specifically in several studies (Klein & Smart 2016; Murtagh et al. 2012; Klöckner & Friedrichsmeier 2011; Vredin Johansson et al. 2006).

Background and situation in life affect the resources one has for travelling. Personal factors of course affect how one uses the resources available. It is worth noting that the resources required for travelling are both material and immaterial. Material resources may refer to e.g. money or transport vehicles. Immaterial resources refer to personal cognitive, physical or mental resources that are required of the person in order to travel. As Shaheen and others (2016) and Korbel and others (2013) imply, when assessing the impacts of information and technology services on travel, cognitive abilities are an important factor in travel behaviour. Lehmann and others (2012) name physical and mental health as personal resources in their study of the influence of elderly people's personal resources on well-being. It can be deduced that not only is good health a personal resource, but physical and mental abilities, coping, and energy in general are personal resources as well.

Mobility is indeed affected by skills and competence (Kellerman 2016; Kaufmann 2004). While people biologically have different features related to skills and competence, the impact of socioeconomic background, such as education, should not be underestimated. Socioeconomic factors also affect the possibilities for daily travel. Some transport systems offer more equal opportunities for mobility than others (Pereira et al. 2017; Martens 2016). This connection between socioeconomic factors and travel demonstrates the interrelation of social and spatial mobility.

There are constraints to travel and mobility. Many of the identified travel constraints relate to the regional insufficiency of transport services. The environment interconnects with travel behaviour (Saelens et al. 2003; van Wee et al. 2002; Boarnet & Sarmiento 1998). The transport environment and transport systems define to what extent different places are

accessible and by what means. This directly affects the alternatives people have concerning their mobility. Environment design and planning can affect travel decisions by encouraging people to engage in a certain travel behaviour (Saelens et al. 2003; Boarnet & Sarmiento 1998). At the same time, individuals' preferences for certain travel modes influence their residential choices (Van Wee et al. 2002). At least in the Netherlands, people with a preference for public transport have been found to emphasise accessibility to it in their residential choice (Van Wee et al. 2002).

Money and time budgets are perhaps the most discussed personal constraints for travel (e.g. Schafer 1998). It is argued, and debated as well, that a travel time budget would be somewhat above one hour per day on average (Lyons & Urry 2005; Schafer 1998). A time budget might anyway be very different on separate trips, and time constraints experienced by individuals can vary widely. The total money budget for travel also varies between individuals. Resources in use and constraints to travel are related to socioeconomic factors and situation in life. For instance, because full-time employment brings on more temporal constraints, Li (2003) argues that reliability and punctuality are valued more highly than cost on commuters' priority lists. Other constraints besides money and time are, for example, disabilities. Age-related disabilities and accessibility problems have been discussed in multiple studies (e.g. Hjorthol 2013; Lehmann et al. 2013). Ipingbemi (2010) itemised the transport constraints of the elderly in Ibadan, Nigeria. Some of the most important constraints listed were poor facilities, long waiting time, long access time, high transport fare, design of commercial vehicles and reckless driving by other road users. Social norms constrain women's mobility in some cultures (Porter 2011). Fear, for example of crime, or among the elderly of falling, is recognised as a constraint for travel as well (Keane 1998; Vellas et al. 1997). To my knowledge, there seems to be a lack of research on personal physical and mental energy as a resource and constraint.

A model by Norros (2004, Figure 2) deals with generic environmental constraints on action. The model has mostly been employed in different safety-critical work environments, but it has also been applied to the traffic environment in analyses of the car-driving task (Rämä & Koskinen 2017). In this model, dynamism, complexity and uncertainty are outcome-critical constraints of working environments. Dynamism refers to the challenge of the environment typically not being stable but in constant change. Complexity relates to the multiple elements and interactions within the environment. Uncertainties in the environment are varied and create their own challenges with regard to action. Taking these three constraints

into account and balancing between them requires skill, knowledge and collaboration (Norros 2004). Humans use their resources and capabilities, such as skills, knowledge and collaboration, to manage the constraints of their environment (Rämä & Koskinen 2017). The idea of resources, capabilities and constraints can be applied to travel beyond the driving task. Mobility involves environment-related constraints and constraints related to the limited resources and capabilities of an individual.

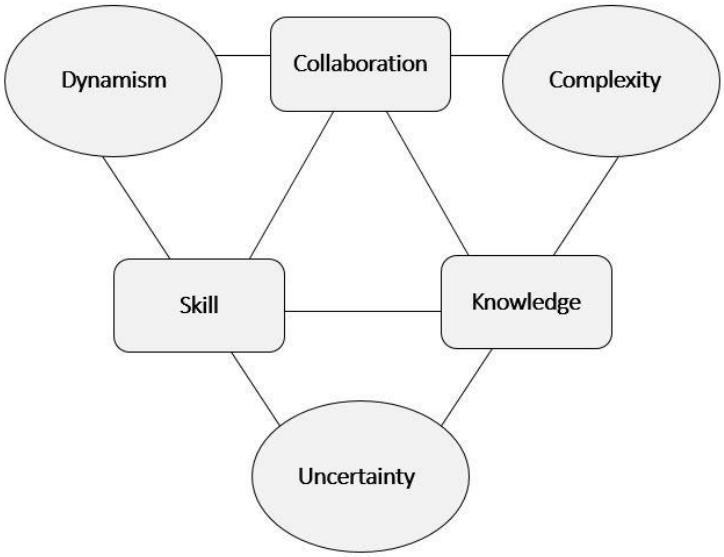

Figure 2. Model of generic environmental constraints on action (Norros 2004). Edited.

People have personal priorities in travel that shape their decisions. These priorities can relate to the use of disposable resources, such as time and money. Susilo and Cats (2014) listed a set of the most important needs and most determining characteristics associated with different groups of travellers by researching the existing literature. These traveller groups are based on working situation, family situation, age, sex and income. For example, key factors for workers employed full-time include punctuality, reliability and cost. Female travellers are concluded to be, at least in London, more conscious and considerate than their male counterparts (Transport for London 2009). Parents with small children, in turn, favour accessible vehicles and stations and onboard space (Susilo and Cats 2014). Strandling and others (2007) studied perceived product performance, quality and customer satisfaction with travel modes. They found that non-instrumental variables, like convenience, cleanliness, comfortability, easiness and safety are important to travellers' satisfaction with their trip.

When deciding between travel modes, people have be found to lean toward those they find most attractive, such as a car, bicycle or public transport (Vij et al. 2013; Van Wee et al. 2002). The attractiveness of travel modes may relate to concrete features such as fast travel time or boot space, but also to personal taste and attitudes. Active users of different travel modes are going to have different perceptions, preferences and priorities beyond variations in environments and situations. However, there seem to be very few studies identifying how individuals see and experience travel modes, and what specific features make them more or less attractive.

Travel behaviour varies across trips. Schlich and Axhausen (2003) concluded day-to-day travel behaviour to be more variable when trip-based (calculating similarity across all days for each person based on trip-based measures) than when time- and budget-based (calculating similarity across all days for each person based on time- and budget-based measures). This implies that people have either different alternatives for different trips, or different preferences for different situations, or both. It is worth noting that situation-specific aspects not only influence travel decisions (Klöckner & Friedrichsmeier 2011) but also vary with different types of trip.

People build their perception of situations in different ways. For example, they have been shown to perceive time differently (Li 2003). Abou-Zeid and others (2012) point out that people may compare their current situation to that of others, to their own past situations, or to existing possibilities. These comparisons build one's perception of situational contentment. In the mobility context, individuals may have different opinions about what trips are feasible (Sager 2006). Perceptions on which decisions are based vary by person and by situation. Again, it appears that little research has been done on individual perceptions of travel opportunities.

Decision-making by individuals in everyday life is a complex issue. Both personal needs and situational affordances define the problem solving in life-task problems (Cantor 1994). A series of steps are involved in decision-making processes: The first step is identifying the issues; the second involves constructing preferences for the situation at hand; the next one is evaluating the available alternatives; and finally the best option or options are determined. (Tzeng & Huang 2011; Keeney & Raiffa 1993; Simon 1977.) These steps can probably be applied to travel decisions as well.

Ajzen's and Fishbein's theory of reasoned action (1975; 1977) and Ajzen's theory of planned behaviour (1985) are well-known psychological theories of behaviour. The theory of reasoned action is based on the premise that humans usually behave in a sensible way. They take the available information into account and implicitly or explicitly consider the implications of their actions. In theory, the intention to perform or not perform a behaviour is a determinant of action. Factors affecting intention are attitude toward the behaviour and subjective norm. Attitude is determined by salient beliefs concerning the behaviour, while subjective norm is the evaluated opinion of important others on performing that behaviour. Additionally, the theory of reasoned action presumes that intention and behaviour are operationally defined to correspond in terms of their target, action, context and time elements (Ajzen & Fishbein 1977).

The theory of planned behaviour (Ajzen 1985) derives from the theory of reasoned action. It differs from the latter in taking nonvolitional factors into account. In this theory, the strength of a person's attempt to perform a behaviour interacts with the degree of his or her control (Ajzen 1985). In other words, it is acknowledged that not all attempted actions can be put into practice because of various constraints. This theory links to the different kinds of travel constraints, which shape mobility.

Fishbein & Ajzen (2011) discuss a set of eight variables that could be used in any behavioural analysis. They were formed by five theorists—Albert Bandura, Marshall Becker, Martin Fishbein, Frederick Kanfer and Harry Triandis—in a workshop to clarify the similarities and differences among their theories (Fishbein & Ajzen 2011: 18–19). The theorists agreed that for a person to perform a behaviour, one or more of the following needs to be true:

1. The person has formed a strong positive intention (or made a commitment) to perform the behaviour.
2. There are no environmental constrains that make it impossible for the behaviour to occur.
3. The person has the skills necessary to perform the behaviour.
4. The person believes that the advantages (benefits, anticipates positive outcomes) of performing the behaviour outweigh the disadvantages (costs, anticipated negative outcomes); in other words, the person has a positive attitude toward performing the behaviour.
5. The person perceives more social (normative) pressure to perform the behaviour than not to perform the behaviour.
6. The person perceives that performance of the behaviour is more consistent than inconsistent with his or her self-image or that its performance does not violate personal standards that activate negative self-sanctions.
7. The person's emotional reaction to performing the behaviour is more positive than negative.

8. The person perceives that he or she has the capabilities to perform the behaviour under a number of different circumstances; in other words, the person has perceived self-efficacy to execute the behaviour in question.

(Fishbein & Ajzen 2011: 19)

These variables have links to multiple mobility-shaping variables discussed in this chapter. Because these variables on behaviour are applicable in understanding travel behaviour and thus mobility, they are examined more closely in the context of travel. How can these variables be applied to travel?

The first variable concerning intention or commitment to perform a behaviour relates to individual needs. Different kinds of needs motivate to either travel or not to travel. The second variable implies that environmental constraints restrict travel. The environment could refer to physical, social, cultural, and other environments alike. The third variable states that the person needs to have the necessary skills to travel. These could include physical, cognitive and mental skills as well as basic capabilities and health. The skills required in travelling could also be thought of as personal travel resources among other kinds of resources such as time and money. Lack of such skills creates constraints. Thus, the second and third variable both relate to possibilities and constraints.

The fourth variable relates to weighing the costs and benefits of different travel options (including the option of not travelling at all). This is done subjectively and is dependent on personal perceptions of the situation. The theorists denote this cost-benefit evaluation as attitude toward performing the behaviour. The approach and terminology are similar in the theory of reasoned behaviour (Ajzen & Fishbein 1975; 1977).

The fifth variable on the influence of social or normative pressure relates to the social and cultural environment. The social pressure could relate widely to societal or communal norms which have been shown to have impact on travel behaviour (Porter 2011), or to the opinion of specific individuals or groups, such as those belonging to the individual's circle of acquaintances (Ajzen 1985).

The sixth variable of behaviour's impacts on self-image is tied to identity. It has been shown that identity, values, personal attitudes and personality affect travel behaviour (Klein & Smart 2016; Paulssen et al. 2014; Murtagh et al. 2012; Klöckner & Friedrichsmeier 2011; Vredin Johansson et al. 2006). Self-image and identity are closely linked to actions including travel behaviour. The seventh variable states that a behaviour can take place if a person's

emotional reaction to performing it is more positive than negative. It is worth noting that this seventh variable does not point to emotional reactions that result from performing the behaviour, but to emotional reactions to the behaviour itself. Emotions, however, also relate to attitudes and beliefs towards performing a certain behaviour. The attitude towards the behaviour, and the beliefs that underlie the attitude, are discussed in the theory of reasoned action (Ajzen & Fishbein 1975; 1977).

The last variable states that perceived capabilities to perform the behaviour shape our actions. This relates to the concept of mobility potential, which I argue is a subjective construct by nature. Because travel decisions are made based on subjective perceptions of situations, a perceived lack of personal capabilities, like any other necessary prerequisite, constricts travel.

One thing to keep in mind is that habits have a remarkable impact on behavioural patterns in general and on travel behaviour itself (Carreno & Welsh 2009; Oullette & Wood 1998). This means that each behavioural choice is not considered separately but depends on our past behaviour. Triandis (1977) presented the relation of habits to intentions as reciprocal: the stronger the determinant habit is, the weaker the determinant intention, and vice versa. In other words, the stronger the habit one has over something, the less probable are changes in that behaviour. Thaler and Sunstein (2008) call this phenomenon a cause of 'status quo bias', which leads people to continue a course of action even when this traditional action is not in their best interest. The reasons for this phenomenon are understandable. Searching for new alternatives and constructing new habits cause psychological stress, and often the expected gains are too uncertain. This makes people stick to their routines rather than change behaviour easily (Gärling & Axhausen 2003). When a new behaviour becomes habitual, conscious intention stops working actively and information processing becomes more automatic (Silva et al. 2016; Ouellette & Wood 1998). Rational arguments do not easily influence non-deliberate choices, and one might make inconsistent travel decisions (Gärling & Axhausen 2003). Some people are more susceptible than others and change their travel behaviour more easily (Carreno & Welsh 2009).

Finally, as noted in the discussion on the seventh variable, emotional reactions shape our actions, because humans are not merely rational actors. Thaler and Sunstein (2008) remind us that people are not 'Homo economicus' but 'Homo sapiens'. They are subject to emotional impulses and temptations when making decisions. In addition, they make biased forecasts of upcoming circumstances and of the implications of their actions. Varying

perceptions and emotional impulses always create uncertainty in human behaviour research, which is important to acknowledge.

3. Method

3.1. Research approach

In this work, daily mobility was approached from a mixed methods perspective, which means combining different methods to better understand the research problem. The methods in this work include a literature review, specialist interviews, a survey, and statistical analysis (Figure 3). These are explained in greater detail in the following chapters. First, however, a few words need to be said about the research approach. While combining different methods is not exceptional, it is worth underlining how this approach and philosophy undergird a comprehensive understanding of mobility.

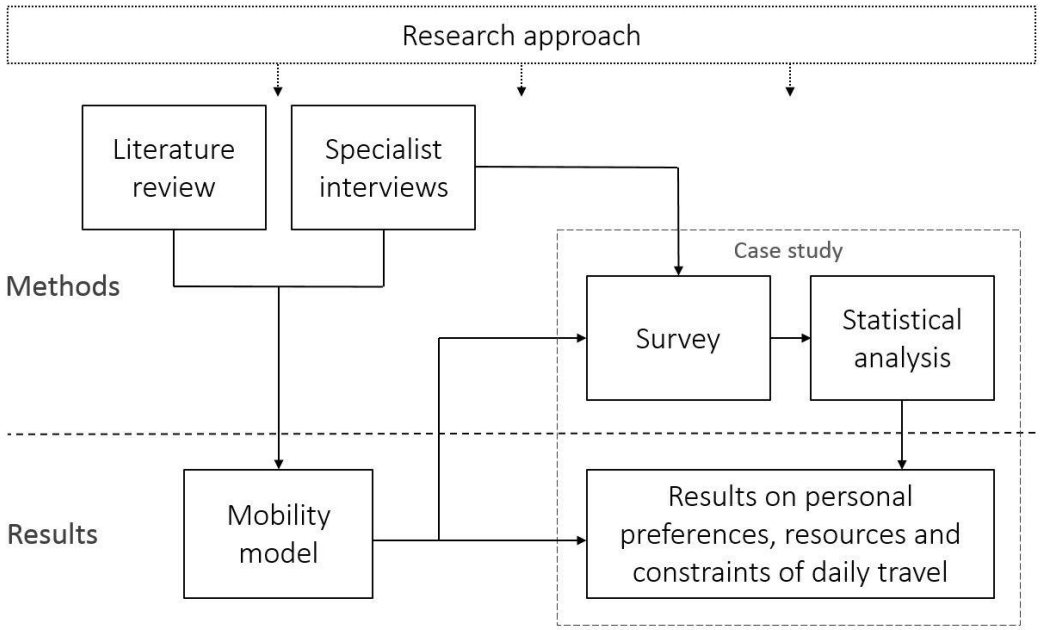

Figure 3. Process, methods and results of the present work.

Mixed methods research has become an increasingly used and commonly recognised approach, along with quantitative and qualitative research (Creswell 2014; Johnson et al. 2007). It can be said that we are currently in "a three methodological or research paradigm world, with quantitative, qualitative, and mixed methods research all thriving and coexisting." (Johnson et al. 2007: 117). Even though mixed methods research has become more general quite recently, and major work developing it stems from the late 1980s, its origins go back further (Creswell 2014). Some early thoughts related to mixed methods

research grew from the idea that all research methods have weaknesses and bias, and that combining both qualitative and quantitative data could compensate for these weaknesses to some extent (Creswell 2014).

One way of describing mixed methods is to underline its focus on the synthesis of quantitative and qualitative research. Although it involves combining or integrating quantitative and qualitative research and data (Creswell 2014), it is not limited to the synthesis of these alone; it extends further in combining different approaches, methods, data or analysis (Johnson et al. 2007; Bazeley 2006). Broader terms, such as 'mixed research' or 'integrative research', have been suggested for this reason, but mixed methods research has become the most popular name for this movement (Johnson et al. 2007).

Mixed methods research is closely tied to a pragmatic worldview (Creswell 2014). "Pragmatism is not committed to any one system of philosophy and reality;" thus researchers can apply the methods, procedures and assumptions that are most suitable for their research needs and purposes (Creswell 2014: 11). In pragmatism, as well as in mixed methods research, the world is not seen as an absolute unity. Nor is it seen as being based on "a duality between reality independent of the mind or within the mind" since "truth is what works at the time" (Creswell 2014: 11). This is relevant in the case of mobility, since it comprehends both realised movement and subjective experience. Pragmatists agree that research invariably occurs in social, political, historical, and other contexts (Creswell 2014). That is why mobility is understood differently in different research contexts.

In this work, the aim of using the mixed methods approach was to construct a creative combination of methods to gain a deeper understanding of personal mobility in both theory and practice. Because the focus in mixed methods research is more on questions than methods (Creswell 2014), the aim was to emphasise the problem and employ various methodological means to understand it more profoundly and comprehensively. I see this method as one way to bring studies on mobility closer to each other. The philosophy of pragmatism and the mixed methods approach are well suited to the case of mobility, since it recognises the different contexts and multiple realities to which mobility research is tied.

This work is divided methodologically into two parts. The first part deals with the creation of a mobility model based on multidisciplinary literature and specialist interviews. The second part involves a survey on individual daily mobility, with focus on individual preferences, resources and constraints in daily travel. The research design adapts something

called ‘a multiphase mixed methods design’ (Creswell 2014), where “concurrent or sequential strategies are used in tandem over time to best understand a long-term program goal” (Creswell 2014: 16). I used a set of methods consecutively and experimentally to study mobility and bring something new and useful to the discussion on defining, measuring and surveying mobility.

3.2. Procedure and methods

3.2.1. Creation of the mobility model

To begin with, the mobility model was drawn up in schematic format highlighting the most relevant factors for the daily mobility of individuals. The literature on mobility (chapter 2.2) and the factors shaping it (chapter 2.3.) was searched and reviewed using three search engines: the University of Helsinki’s library search engine, VTT’s own search engine, and Google Scholar. Only articles that were available free of additional charge were included. Some material was also received from teachers, colleagues and the interviewed specialists.

The model of transport mobility by Innamaa and others (2013, Figure 1) was used as a basis for the mobility model. It was expanded from transport mobility factors to include potential mobility factors as well. The purpose of the mobility model is to identify different areas of mobility, including those factors that are not typically included in empirical mobility studies.

A tentative mobility model was then discussed in unstructured interviews with three specialists experienced in mobility issues who had previously worked with travel surveys. The specialists were Pekka Räty from the Helsinki Regional Transport Authority HSL, who is responsible for the authority’s travel surveys; Virpi Pastinen from WSP Finland, who is experienced in conducting and analysing national travel surveys; and Pirkko Rämä from VTT Technical Research Centre’s transport research unit, who is well versed in travel surveys and travel psychology. In addition to the mobility model, questions and challenges related to studying specifically personal travel preferences, resources, constraints and priorities were discussed.

The purpose of the interviews was to glean from the specialists’ experience new sophisticated viewpoints and aspects to be included in the mobility model and considered when conducting the survey. The aim was to uncover factors that had either gone unnoticed

or had not surfaced during the mobility literature review. The interviews were unstructured because of their purpose; it would not have been helpful to stick too closely to questions that restricted the discussion to my own viewpoint. The unstructured interview as a method involves asking somewhat open-ended questions to discover the interviewee's perceptions of the topic of interest (Firmin 2008)—in this case personal mobility. The advantages of an unstructured interview include a greater likelihood of getting more meaningful and complete answers, at the expense of technical comparisons and generalisability (Coolican 1999). However, because the latter were not sought in this case, these weaknesses do not matter.

The interviews lasted roughly one hour each and were recorded with the interviewee's permission. The resulting material was used to test the credibility of the mobility model, identify deficiencies or incongruities, and later to formulate suitable survey questions. Direct quotations are not cited here, but the ideas generated from the discussions are presented somewhat generally to further build the personal mobility model and develop the survey method.

The tentative personal mobility model was shown to the specialists for their comments and ideas. The main themes discussed were as follows:

- Socioeconomic factors or life situation shaping travel
- Situation-related aspects affecting travel decisions
- Features of travel modes that people find attractive or unattractive
- Things required for a person to travel in accordance with their wishes (resources, features or tools)
- Mental or physical energy (i.e. the opposite of stress or tiredness) required when travelling
- Designing a travel survey that motivates respondents and generates realistic answers
- Deficiencies or contradictions in the tentative personal mobility model.

3.2.2. Survey on daily mobility

Some aspects of daily mobility were covered by the survey, which focused specifically on individual mobility resources and constraints, and travel preferences and priorities. These elements form part of the mobility model that was later constructed (chapter 4.1.3.) Due to

the limited research resources, the study is restricted to urban areas for two reasons. First, urban areas are interesting in terms of travel behaviour, as they offer most citizens multiple options for daily travel. Second, new travel modes and services generally originate in, and spread from, urban areas; thus changes in the travel choices of people are more likely to emerge in these areas.

The survey was conducted in December 2016 in five Finnish cities: Helsinki, Espoo, Vantaa, Tampere and Turku. The target sample size was 1 000 responses. The target sample size was stratified to provide enough responses from each city as follows: 500 respondents from the Helsinki capital region (Helsinki, Espoo and Vantaa), 250 from Tampere and 250 from Turku. The survey was limited to daily mobility, leaving out non-daily travel like tourism. Only citizens over 18 years of age were surveyed. The survey was designed and constructed by the author. The answers were collected by the market research company Taloustutkimus Oy.

The respondents belonged to the Internet panel of Taloustutkimus Oy. Online consumer panels are regularly used in social and market research, "particularly where the survey needs to include a wide geographical coverage" (May 2011: 121). These panels are voluntary and their members sign in themselves, which is important to remember. May points out (2011: 121) that these panels "are technically for research purposes no different to convenience samples often based on quotas established from population profile statistics". Since most of the respondents have Finnish as their native tongue, the survey was conducted in Finnish to minimise misunderstandings. Given that the aim of the survey was not to give a representative picture of any particular group but rather to find new viewpoints to researching mobility, the representativeness of the sample is not that crucial.

The purpose of the survey was to gain information on areas of mobility not typically included in mobility studies, in order to increase our understanding of mobility and ways of studying it. Also, the focus was not on realised travel but on individual experiences that bear upon travel decisions. The survey was experimental in that different types of questions were asked to see how they work. Questions on preferences, priorities, resources and constraints related to daily travel were included, as well as scales and multiple-choice questions, and open questions to get unexpected viewpoints. Other questions required the respondent to prioritize factors in terms of practical significance for them. The survey questions are shown in Appendix 1.

3.3. Survey study areas

The survey covered the five cities of Helsinki, Espoo, Vantaa (Capital Region), Tampere and Turku. The Finnish capital, Helsinki, is the country's most populated centre with around 635 000 residents (Tilastokeskus 2017a). The neighbouring cities of Espoo and Vantaa together have roughly half a million inhabitants (Tilastokeskus 2017a), bringing the population of the Capital Region to over one million. The population of Tampere is about 228 000 and that of Turku around 188 000 (Tilastokekus 2017a).

Helsinki is located on the country's south coast. Espoo and Turku are also coastal cities, whereas Tampere and Vantaa are inland. Helsinki is the most densely populated city, with almost 3 000 residents per square kilometre. This is high compared to the other cities in the study: the density in Espoo and Vantaa is around 900, in Turku around 750 and in Tampere around 450 residents per square kilometre (Tilastokeskus 2017b). The low population density in Finnish cities is a challenge for public transport (Lahti 2000).

Public transport in Helsinki consists of bus, tram, metro, train and ferry traffic. These are operated by Helsinki Region Transport HSL, which is also responsible for Espoo and Vantaa (HSL Helsingin seudun liikenne 2017). Currently, ferries, trams and the metro operate only in the Helsinki area. A new metro line, the opening date of which remains unclear at the time of writing, is expected to operate soon in Espoo as well (HSL 2017). In Helsinki, it is estimated that slightly more than half of the car or public transport trips are made with public transport (HSL Helsingin seudun liikenne 2015), whereas in Espoo and Vantaa it is less than a third (HSL 2015). In late 2016, the number of registered cars was 410 per 1 000 residents and the number of commissioned cars (cars in use) 330 per 1 000 residents (Helsingin kaupunki 2017). The number averaged 440 per 1 000 residents in Espoo and Vantaa (Helsingin kaupunki 2017).

The city of Helsinki and its surrounding areas are expected to grow rapidly in the near future. The population of Helsinki is predicted to reach 860 000 by the year 2050 (Helsingin kaupunki 2015). The population of the entire Capital Region is expected to rise to 2 million (Helsingin kaupunki 2015). The Helsinki Master Plan includes a vision of Helsinki being a multi-centred network city by 2050 (Helsingin kaupunki 2015). The Helsinki City Strategy states that a growing and successful city cannot rely on responding to growing vehicle traffic

demand by providing more infrastructure alone, because increasing supply will increase demand as well (Helsingin kaupunki 2015). The aim is to develop sustainable transport by providing competitive alternatives to private cars on everyday trips and ensuring good accessibility by sustainable travel modes (Helsingin kaupunki 2015).

In Turku, public transport is operated jointly with six neighbouring municipalities by Turku Region Public Transport, known as Föli (Föli 2017). The Turku Region Public Transport Committee makes all the decisions on matters related to public transport (Föli 2017). The public transport routes are operated by buses, and a new ferry line was launched in the summer of 2017 (Föli 2017). There are three railway stations in Turku: Central Station, Kupittaa, and one in the harbour. Railway traffic is operated by the national VR Group, which in Turku focuses primarily on long-distance transport. The Turku Urban Strategy states that the planning and implementation of new residential areas near the city centre will be enhanced with intelligent digital services and innovative energy and transport solutions (Turun kaupunki 2014). The urban structure in this vision is streamlined. It embraces the walkability of central areas, and ease of travel by different transport modes and their connectivity (Turun kaupunki 2017).

Public transport in Tampere is operated by the Tampere Regional Transport, or Nysse (Nysse 2014). As in Turku and Helsinki, public transport in Tampere is operated jointly with the neighbouring municipalities. The routes are operated by buses. There is one railway station in the city centre. The Tampere tramway is under construction and is set to be completed in 2021 (Raitiotieallianssi 2017). It is the key public transport project in Tampere (Tampereen kaupunki 2013). Walking, cycling and public transport are being developed (Tampereen kaupunki 2013). As to urban planning and structure, Tampere is aiming toward a dynamic city centre. This includes the development of walking, cycling and public transport facilities, complementary construction and underground parking (Tampereen kaupunki 2013). It is stated in the strategy that land use, housing, transport and services are to be reviewed as a whole. The city centre and district centres with good public transport connections are being developed as versatile service clusters (Tampereen kaupunki 2013).

In all the survey areas (Helsinki, Espoo, Vantaa, Turku and Tampere), on average 78% of 18-year-olds had a valid car driving licence in 2015 (driving licence statistics: Trafi 2015, population statistics: Tilastokeskus 2015).

4. Results

4.1. Mobility model

4.1.1. Literature

The mobility model is based on the literature reviewed in chapters 2.1–2.3 and on the specialist interviews. The main points concerning mobility that were found in the literature are presented here. The next chapter specifies the main points from the specialist interviews. Based on the literature, at least the following seem to be relevant for mobility:

1) Demographic and socioeconomic factors are related to realised travel.
(e.g. Wu et al. 2015; National Travel Survey 2010–2011; Tuominen et al. 2007.)

2) Personal attitudes, values, identity, personality and self-image affect travel decisions.
(Klein & Smart 2016; Paulssen et al. 2014; Murtagh et al. 2012; Fishbein & Ajzen 2011; Klöckner & Friedrichsmeier 2011; Vredin Johansson et al. 2006.)

3) Personal resources affect mobility. Resources can, for instance, be money or time. Also physical, mental and cognitive abilities, skills and competence can count as resources. Lack of resources or other personal or environmental constraints can restrict mobility.
(Kellerman 2016; Fishbein & Ajzen 2011; Kaufmann 2004.)

4) Socioeconomic factors, background and life situation affect mobility by shaping the needs, resources and constraints related to travel.
(Pereira et al. 2017; Kellerman 2016; Martens 2016; Kaufmann 2004.)

5) Habits and their intensity influence behavioural patterns in general but also travel behaviour and mobility.
(Silva et al. 2016; Carreno & Welsh 2009; Thaler and Sunstein 2008; Gärling & Axhausen 2003; Ouellette & Wood 1998; Triandis 1977.)

6) People are not rational beings; emotions and impulses affect travel behaviour.
(Abou-Zeid et al. 2012; Thaler and Sunstein 2008.)

7) Individuals' decision-making mechanisms are different, and people make comparisons between multiple options based on different kinds of premises. Individuals' perceptions of situations, opportunities and barriers differ and affect mobility.
(Abou-Zeid and others 2012; Thaler and Sunstein 2008; Sager 2006.)

8) In a decision-making situation, problems are identified, preferences are constructed, alternatives are evaluated, and the best options are determined.
(Tzeng & Huang 2011; Keeney & Raiffa 1993; Simon 1977.)

9) Needs related to mobility are individual and varied. Travel is required to satisfy other needs, but people also have a primary need to move (Kellerman 2016.)
Also other needs, such as resting, shape mobility. Prioritisation between needs and in the use of resources to fulfil them is needed, and not all trips are realised.

10) People have different preferences and priorities related to travel.
(Susilo and Cats 2014; Vij et al. 2013; Strandling et al. 2007; Van Wee et al. 2002.)

11) Environment- and situation-specific aspects affect mobility. In addition, travel behaviour varies with different trip types.
(Klöckner & Friedrichsmeier 2011; Saelens et al. 2003; Schlich and Axhausen 2003; Van Wee et al. 2002; Boarnet & Sarmiento 1998.)

4.1.2. Specialist interviews

Factors related to mobility were the focus of the interviews. Multiple viewpoints came up, and the discussions also led to the discovery of some of the literature in chapters 2.1–2.3, such as the theories by Ajzen and Fishbein. The main conclusions from the interviews overlap in some parts with the results of the literature review and are as follows:

Age and gender correlate with travel behaviour, but a person's life situation is closely linked to mobility. Education, occupation and income influence personal prerequisites for travel. A person's life situation shapes the needs that necessitate travel or prevent it. It affects daily schedules and use of time, which substantially relate to travel decisions. It also relates to personal responsibilities; many people are addressing not only their own needs but those of their loved ones or others as well. Besides working situation and family, the specialists confirmed that lifestyle is also an important factor in travel decisions.

Socioeconomic factors and life situation affect decisions on where an individual or family lives. Different kinds of families move to different residential areas. Land use and its efficiency differs from one residential area to another, and affects which travel modes are available and best to use. Place of residence typically relates to car use and ownership, but the causality of this is more complex.

People seem to value different things in travelling and they experience situations differently. This emerges in travel studies, where different demographic groups make dissimilar travel decisions. Some people may appreciate their freedom when having a car in use, while others may feel that public transport is the most effortless way to go. Others yet again have fears related to travel that affect their decisions. Some may find a travel mode pleasant while others find it unpleasant. Social connotations and personal values can shape travel behaviour as well. The appreciated features of different travel modes include rapidity, freedom, privacy, physical exercise, nice views, reliability and punctuality.

People have different preferences for travel when it comes to deciding between available travel modes. It is not clear, however, why some find public transport or a car more attractive than others. The features that people appreciate in different travel modes are somewhat unclear. In the case of a car, someone might enjoy the act of driving, the autonomy and freedom, or the privacy. Someone else might consider it work. In public transport, some attractive features can be meeting other people, environmental impacts or release from the stressful driving task or car maintenance. Walking and cycling may be considered attractive alternatives because of the physical exercise, enjoyment of the outdoors, health or environmental impacts, freedom from schedules, and the low or non-existent costs. On the other hand, these or travel with any other mode can be mentally draining. It is possible that pure desire to use some mode is the determining factor in travel decisions. Some people find reliability and punctuality more important than other factors, but situations can affect their importance. Different individuals can tolerate more uncertainty, for example, related to transport vehicle changes, while others find it stressful. Risk taking and -toleration also relate to personality and to physical and mental skills.

Trips and the circumstances under which they are made differ from each other. Situation-specific factors affect travel decisions. Weather, time in use, availability of alternatives, purpose of trip, luggage, and parking availability and cost are examples of situation-specific factors. It is hard to define all of them. Requirements and expectations are dissimilar on different trips, for example to work, the grocery store or a leisure activity. The need for reliability and punctuality of travel may also differ between trips.

One matter of relevance is that trips are not completely separate from each other. A travel decision in the morning affects the alternatives available later in the day. People also plan trips depending on what they will be doing later. Traditionally, trip-chains made with a car or bicycle need to start from home and end at home. The whole day's travel could be seen

as an entity. Trip-chaining is, indeed, a very relevant factor in travel models and has been discussed in many studies (e.g. Primerano et al. 2008; Adler & Ben-Akiva 1979). Although not covered specifically here, it is important to acknowledge as a factor affecting travel behaviour.

There are multiple prerequisites for an individual to move. People have different abilities and skills that are required for travelling. First, travelling needs the simple physical ability to move, either independently or with assistance. Driving a car or other motorised vehicle requires ownership or other access to the vehicle, a driving licence, driving skills and economic prerequisites. Using public transport requires its own set of skills; for example, the traveller must process information about routes, timetables and ticket purchases. Economic resources are also needed for travelling on public transport. People with physical disabilities face another set of challenges; to travel, there must be trust in one's own ability to cope in different situations and environments related to trips. Some people may start to fear travelling because of a physical condition that caused inconvenience. Not having these prerequisites creates travel constraints. One specialist suggested that personal economic constraints could be surveyed by asking whether the respondent needs to think actively about the cost of daily travel.

Travel cannot be too hard, otherwise trips that are not absolutely necessary will not be made. With public transport, there need to be suitable connections and a stop or station sufficiently close. Travelling has to be clear and simple, without a lot of waiting or changes between vehicles. The timing of trips dictates viable alternatives, since transport conditions and services differ during the day or week. The place of residence also has an effect. Travelling not being too hard seems to relate to some kind of mental resources, such as mental energy, coping or effort required, but no studies appear to discuss it.

Mental resources, such as energy or effort, certainly relate to the life situation and how challenging it is. For example, a person working long, hard days will probably desire the easiest possible option in the afternoon. When an individual becomes mentally tired, the effort they are willing and able to make to travel probably drops. Physical tiredness only adds to the challenge.

Needs related to travel also vary. Without taking a stand on whether travel arises from specific primary or derived needs, people seem to have a universal motivation to move. As an example, when people retire from work and are not obliged to commute, they use more

time on other trips, and the total time spent travelling is not dramatically reduced. It is not really known why this happens. Perhaps it derives from a desire to maintain a certain rhythm in daily life or a need to see other people and participate in activities. It could also relate to a need for variety, walking or exercise. Perhaps the time released from working life now allows retirees to meet those mobility needs that work used to take priority over. Important to note is that mobility is not only shaped by travel needs, but by other needs as well. For example, the need to rest may take priority over the need to leave home.

When people are asked if they would have had an alternative to the chosen travel mode on a certain trip, they commonly answer yes. It is not, however, clear what they consider as actual alternatives. A person might understand that walking for an hour-and-a-half would have be an alternative to using a car, but they would never have chosen it. Some alternatives never become realised. It is hard to know what people consider as realistic and potential alternatives when travelling. It is worth keeping in mind that even if one has alternative modes for one trip, on another trip there might be just one option. This may be the case for some car owners: they need the car for specific trips, and since they already bought the car they use it for other trips as well. Decisions about distinct trips are not always made separately but are weighted by larger decisions and investments.

Compromising between different needs relates to utility functions that can be individual. Travelling is realised where people's individual preferences, needs, and other factors meet the circumstances. This should be taken into account in the mobility model.

The specialists also gave practical advice for the survey. A questionnaire needs to be built as neutrally as possible without favouring certain values. Then, the respondents must be motivated to answer. The specialists emphasised that when asking people about attitudes, personal perceptions, intentions or experiences, the situations need to be described clearly. Best is if the respondents can easily link the situations to their own life. Asking about priorities and the importance of certain features may require some introduction to the respondent. Interviews could give a deeper understanding of experiences, but they are more resource-expensive than surveys, and fewer responses are often gathered.

4.1.3. Introduction to the mobility model

The mobility model is a comprehensive framework of mobility (Figure 4). It is pictured from the individual's point of view because of the nature of mobility as travel potential. In the model, personal variables generate prerequisites for mobility. When personal variables of mobility meet the environment-related and situation-specific factors, an individual creates the perceptions of opportunities and constraints along with the estimates of costs and benefits of different alternatives. Willingness and the ability to use personal resources in order to fulfil personal needs within the limits of the given environment affect the travel decisions an individual makes. Personal variables and decision-making can lead to realised mobility.

The mobility model is built on the multidisciplinary literature introduced in chapters 2.1– 2.3 and specialist interviews (chapter 4.1.2). The model is divided into three sections. The first, on the left side of the model, covers *personal variables* of mobility. The second, in the middle of the model, is the *decision-making* part. The third section of the model, *travel characteristics* of realised mobility, is on the right and is derived from the mobility model by Innamaa and others (2013). The variables in the mobility model are introduced next, section by section.

Section one: Personal variables

An individual person has a set of *needs* and *resources*. The personal needs and resources are closely linked to the individual demographic and socioeconomic *background* and *life situation*. An individual has a *personality, identity* and *preferences* that underlie mobility. Individual also has *routines* that shape mobility.

Background and life situation include the following variables:

- *Demographic variables*, such as sex and age.
- *Socioeconomic variables*, such as income and education.
- *Life situation,* including at least work, family and health variables. It is interconnected and partly overlapping with socioeconomic variables. Work denotes not only occupation but also variables such as working times, remote working practices and the stressfulness or heaviness of work. Family refers to family members and children, or alternatively to the household members of the individual.

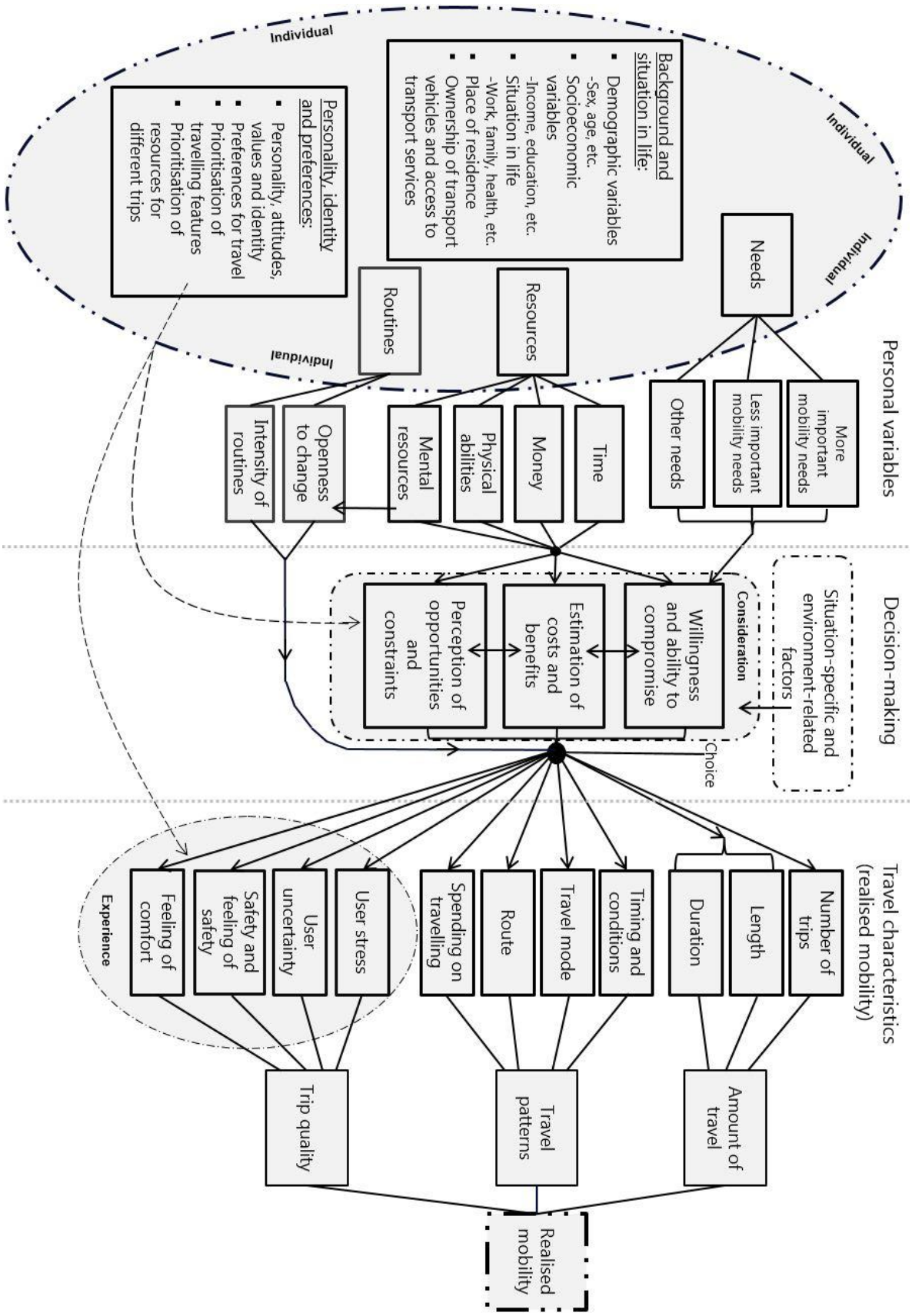

Figure 4. Mobility model based on the literature and specialist interviews. Travel characteristics are based on the model by Innamaa et al. 2013.

- *Place of residence,* referring to residence location and environment.
- *Ownership of transport vehicles and access to transport services*. Ownership of transport vehicles refers to ownership of a car or bicycle, for example. Access to transport services means access to public transportation vehicles or to the information required to use it.

Personality, identity and preferences include the following variables:

- *Personality, attitudes, values and identity* have an effect on mobility. They influence how an individual perceives situations and is willing to act. Personality, attitudes, values and identity are shaped in the social environment, and thus social norms affect them.
- *Preferences for travel* refers to individual taste and experience when it comes to travel.
- *Prioritisation of travelling features* refers to the relative importance of travelling features, such as rapidity, reliability or affordability, to the individual.
- *Prioritisation of resources for different trips* means how an individual is willing to use disposable personal resources to fulfil their mobility needs.

Needs include the following variables:

- *More important mobility needs* refer to those mobility-related needs of an individual that are not easily compromised. For example, going to work is typically an important need for mobility.
- *Less important mobility needs* refer to those mobility-related needs of an individual that are more easily compromised than the more important ones. Other needs may quite easily take priority over the less important mobility ones.
- *Other needs* are needs that are not directly linked to travel but still shape mobility. For example, the need to rest can take priority over the need to visit a friend.

Individual needs for mobility vary. They can relate to meeting other needs, such as going to work, participating in activities or taking care of essential chores like grocery shopping. Individual needs for mobility can also originate from social needs, the need for variety, curiosity seeking or craving for exercise. Mobility relates to many human needs.

In this three-variable classification, mobility needs are divided into more important mobility needs and less important ones.

Resources include the following variables:

- *Time* means the time an individual has available.
- *Money* refers to the monetary resources an individual has available.
- *Physical abilities* refers to the physical capability, skills, competence and energy required from an individual to travel.
- *Mental resources* refers to the mental and cognitive capability, skills and competence, as well as mental energy, required from an individual to travel.

Routines include the following variables:

- *Openness to change* refers to an individual's ability, willingness and tendency to search for new alternatives and construct new habits. Mental resources affect openness to change, since searching for new alternatives and constructing new habits causes psychological stress and requires capability, skills and energy.
- *Intensity of routines* refers to the strength of travel-related habits. Stronger habits indicate lower probability of changes in behaviour.

Section two: Decision-making

Individuals perceive, estimate and prioritise things differently. Consideration in the decision-making process is based on the individual's needs and resources. Environment and time affect the circumstances under which the decision-making is done. Routines affect decision-making without conscious consideration.

Situation-specific and environment-related factors refer to external factors affecting travel behaviour, such as available travel services in a given time and place, weather, traffic situation, design of the environment or social order in that particular place.

Consideration includes the following variables:

- *Willingness and ability to compromise* refers to the use of finite resources to fulfil these needs of different importance.
- *Estimation of costs and benefits* refers to the subjective perception of the costs and benefits of the travel behaviour.
- *Perception of opportunities and constraints* refers to the individual's subjectively perceived opportunity to act in a given environment with given premises.

The personality, identity and preferences of an individual affect the variables of consideration.

Section three: Travel characteristics

The third section is realised mobility and its characteristics. Realised mobility consists of *amount of travel*, *travel patterns* and *journey quality*. *Amount of travel* and *travel patterns* are subjects of objective measures. *Trip quality* is a more complex matter. While many concrete factors play a role in the quality of trips, an individual's own subjective experience is a relevant part of the trip quality.

Amount of travel includes the following variables:

- *Number of trips* made by an individual.
- *Length* of trips in distance made by an individual.
- *Duration* of trips made by an individual. Duration and length of a trip in distance are often related but they are not parallel. Travel mode, route and speed, for instance, affect the duration of trips. So does destination, which may be selected based on the travel possibilities.

Travel patterns includes the following variables:

- *Timing and conditions* means the time of the day or week when the trips are made and under what situational conditions, such as congestion or weather.
- *Travel mode* with which the trip is made.
- *Route* along which the trip is made.
- *Spending on travelling* means the individual's monetary spending on travelling.

Trip quality includes the following variables:

- *User stress* experienced by an individual caused by travelling.
- *User uncertainty* experienced by an individual while travelling. User uncertainty is affected by the reliability of transport services and timetables, for example. Different people experience uncertainty differently.
- *Safety and feeling of safety.* Safety is related to the probabilities and objective safety measures, while feeling of safety refers to the experience of an individual and perceived safety while travelling.
- *Feeling of comfort* experienced by an individual while travelling.

The trip quality variables are dependent on individual's personality, identity and preferences, since individuals experience situations and circumstances differently. For example, attitudes towards different travel modes affect the way an individual experiences comfort in them. Similarly, depending on their personal traits and background, experiences of stress and safety vary between individuals.

4.2. Survey results

4.2.1. Background of the respondents and their everyday travel practices

The survey included questions on many themes related to mobility. The questions concerned, for example, daily travel practices in general, distances to everyday places, time use, unrealised trips, constraints, preferences and priorities (full survey in Appendix 1). The analyses conducted in this work focus on preferences, priorities and constraints of everyday individual mobility.

Mobility preferences, priorities and constraints relate closely to three areas of mobility identified in the mobility model introduced in chapter 4.1.3. The three areas are indicated in green in Figure 5. First, they relate to the resources an individual has for travel. These are time, money, physical abilities and mental resources. Second, they relate to the individual's willingness and ability to compromise between the use of resources and the fulfilling of needs. Third, they relate to the individual's perception of mobility opportunities and constraints. Some basic background information about the respondents and their everyday travel practices is introduced below.

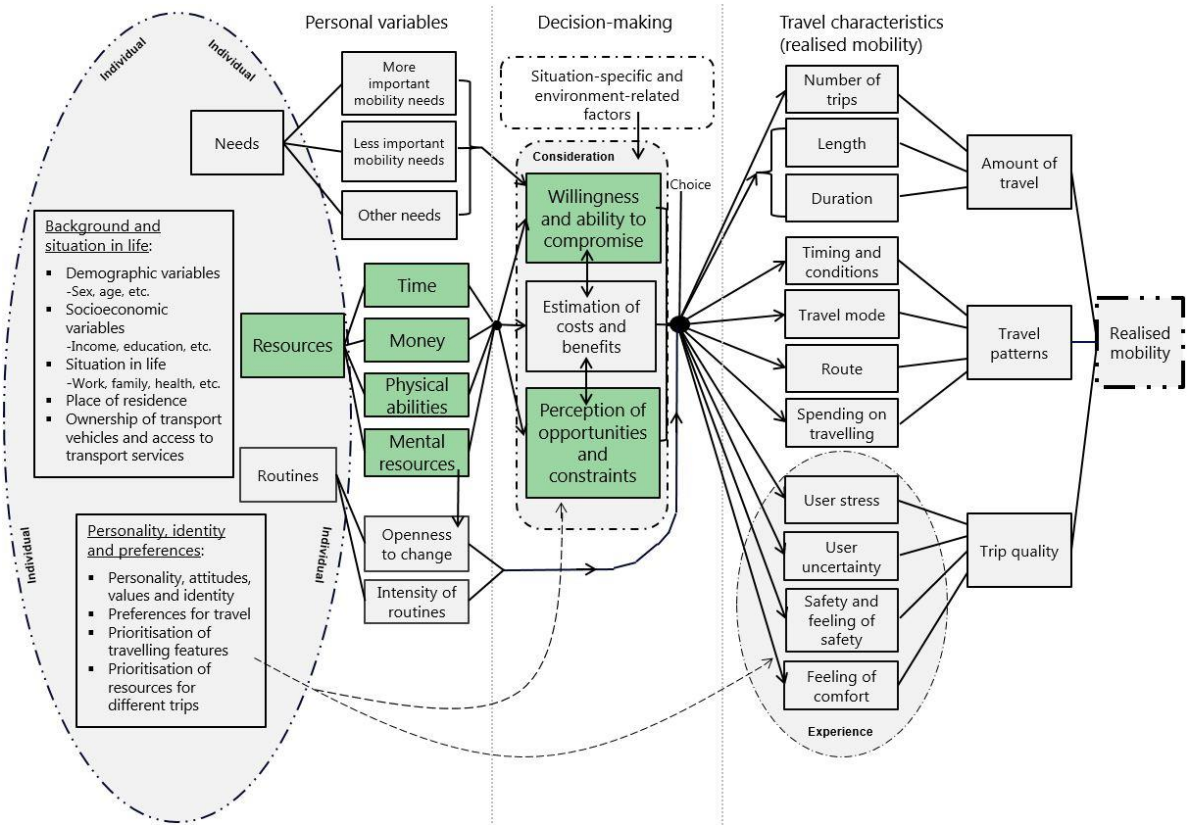

Figure 5. Mobility model. Areas of mobility covered in survey analyses indicated with green colour.

Altogether 1163 respondents answered the survey on individual mobility. Of them, 326 were living in Tampere, 307 in Turku, 292 in Helsinki, 129 in Espoo and 109 in Vantaa (i.e. 530 in the Helsinki Metropolitan Area). The spatial distribution within cities by postal code was fairly even, but given the large number of postal code areas and thus small number of respondents in each, the data was insufficient to analyse statistically by postal code. The spatial distribution of respondents in the cities is shown in Appendix 2.

The age distribution of the respondents is uneven, with more elderly than young taking part (Figure 6). Only 53 of 1163 respondents were between 18 and 24 years of age. Thus, the two youngest age groups were combined for analysis into one group from 18 to 34 years with 164 respondents. The number of respondents aged 35–49 years was 250, those aged 50–64 years 390, and those aged 65–79 years 359. The total number of male and female respondents was almost equal, with 571 men and 592 women, but varied by age category. Among 35-year-old respondents there were more women than men. Conversely, among those aged over 64 years there were more men than women. Statistically significant interdependency occurs between age group and gender at a significance level of 0.01.

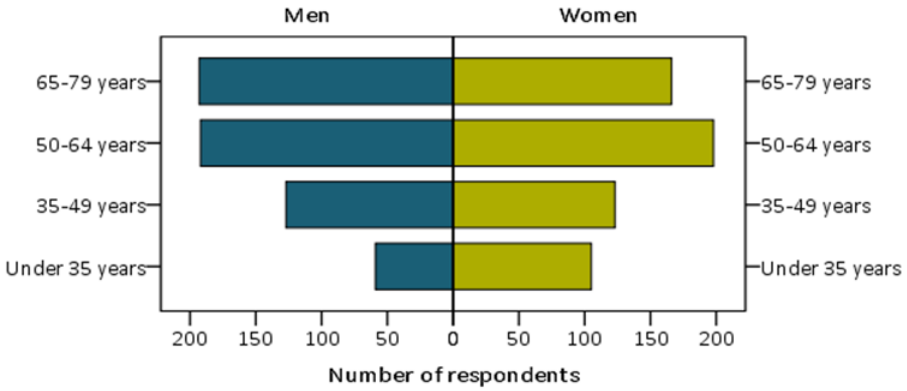

Figure 6. Age and gender distribution of the respondents.

The most common annual household gross income of the respondents was €20 000–40 000, followed by €40 000–60 000 (Figure 7). That of women was lower than that of men. There was a significant interdependency between gender and household income at a significance level of 0.01. In addition, age and household income were interdependent at a significance level of 0.01. Younger respondents had a lower household income more often than older respondents. More than 30% of those aged under 35 years had a household income of €20 000 or less. However, it should be noted that household size often affects household income, and younger respondents might have more one-person households than older respondents.

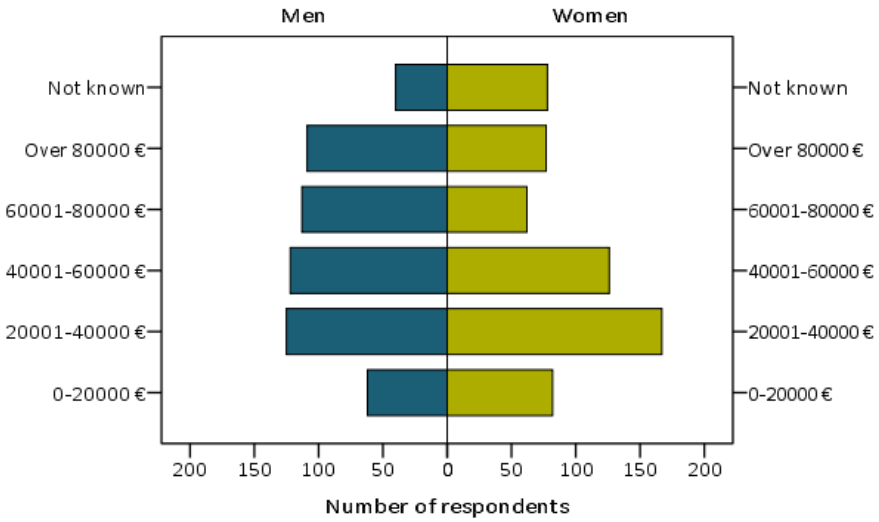

Figure 7. Household (gross) income distribution of male and female respondents.

Most of the respondents, 338 in all, were living in a one-person household. Among the others, 344 were living in a couple household, 231 in a household with children aged under 18, and 250 in a household with only adults aged over 18.

Among the respondents, 57% were working, 27% were retirees, 8% were students, 8% were unemployed and 1% were staying at home with a child (Table 1). The respondents tended to be well educated: over a third had an academic degree, and fewer than 10% had no degree after comprehensive school. The share of respondents with an academic degree is roughly representative of the population in the study areas, with 38% on average of the population aged 15 or over in Helsinki, Espoo, Vantaa, Tampere and Turku having one (Tilastokeskus 2016). Respondents who did not have a degree after comprehensive school seem to be underrepresented, since in the study areas 27% of the population aged 15 or over does not hold a degree (Tilastokeskus 2016). However, some share of this group will presumably earn a degree in the future. Degrees in higher education are generally more common in the cities than in the countryside (City of Helsinki Urban Facts 2009).

Table 1. Occupation of the respondents.

Occupation	Share of respondents
Retiree	27%
Managerial employee, specialist	19%
Clerical worker	16%
Employee	15%
Student	8%
Unemployed	8%
Entrepreneur	4%
Leading position	3%
Stay-at-home parent	1%

Of the respondents, 74% reported having a car in their household. Not having a car appeared to be more common among respondents living in the most central areas, but the data was insufficient to make a statistical analysis based on postal codes. Car ownership in the postal code areas is shown in Appendix 2. Owning a car was interrelated with household income at a significance level of 0.01. Only 29% of respondents with a household income under €20 000 had a car, compared with at least 86% among income groups of €40 000 or more. Owning a car was more common among male than female respondents.

The respondents were asked some basic information about their daily mobility. Among them, 87% had a driving licence and 82% had a valid seasonal ticket for public transport or loaded value on their public transport travel card. The share of people having a car driving licence was slightly higher in the survey sample than in the study area population in general. In the Helsinki, Espoo, Vantaa, Turku and Tampere areas, 78% of 18-year-olds had valid a driving licence in 2015 (driving licence statistics: Trafi 2015, population statistics: Tilastokeskus 2015). Of the respondents, 69% said they had the possibility to drive a car on ordinary trips, 52% that they had the possibility to travel by car as a passenger on ordinary trips, and 79% that they had both possibilities, which is a higher share than the share of respondents having a car in their household (74%).

As many as 96% of respondents said that they had the possibility to use either a bus, train, tram or metro on their ordinary trips. Most of the respondents were satisfied with the public transport connections in their city and on their ordinary trips. On a scale of one to five (one indicating 'very unsatisfied' and five indicating 'very satisfied'), 74% of the respondents chose between options four and five in relation to public transport connections generally in their city, and 70% did so in relation to public transport connections on ordinary trips.

The respondents were asked how often they typically use different travel modes in the summer and winter seasons (Figure 8). The summer season was defined to last from May to October and the winter season from November to April. Driving a car was the most common mode of travel in daily or almost daily use, with almost no difference between the summer and winter seasons. Roughly 43% of the respondents said that they drive a car daily or almost daily, and around one-third said that they do so rarely or never. Daily or almost daily use of public transport was more common during the winter season, with slightly less than one-third of respondents saying that they use it. Over 20% of the respondents said that they use public transport rarely or never. Use of a bicycle was more common during summer than in winter, with 23 percent of the respondents saying that they use it daily or almost daily in summer, compared with only 7% in winter.

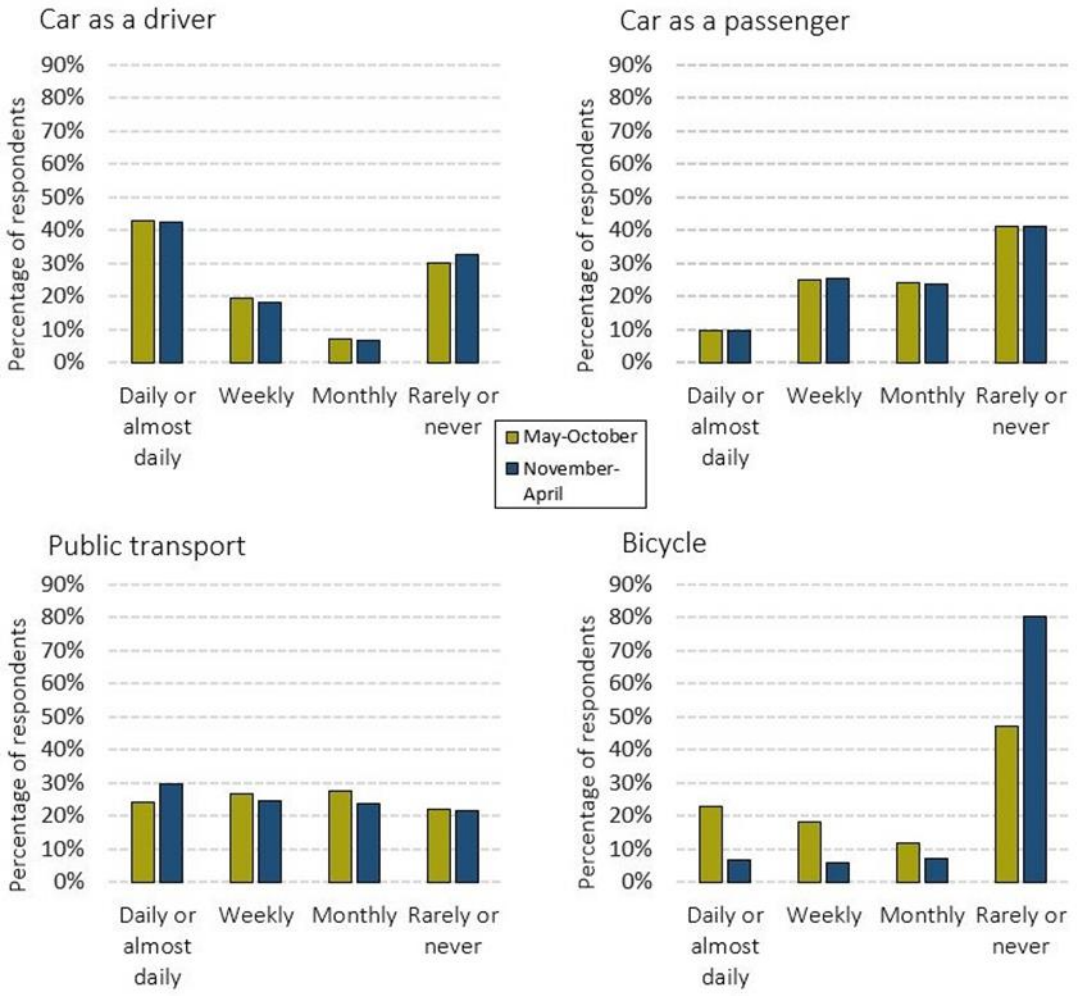

Figure 8. Respondents' use of travel modes in summer and winter.

The respondents were asked which travel modes they typically use on trips to six defined ordinary places. The responses show that different travel modes are used for different trips (Figure 9), one possible reason being distance. The distance to work, place of study or leisure activities is generally longer than to the grocery store or post office (Figure 10).

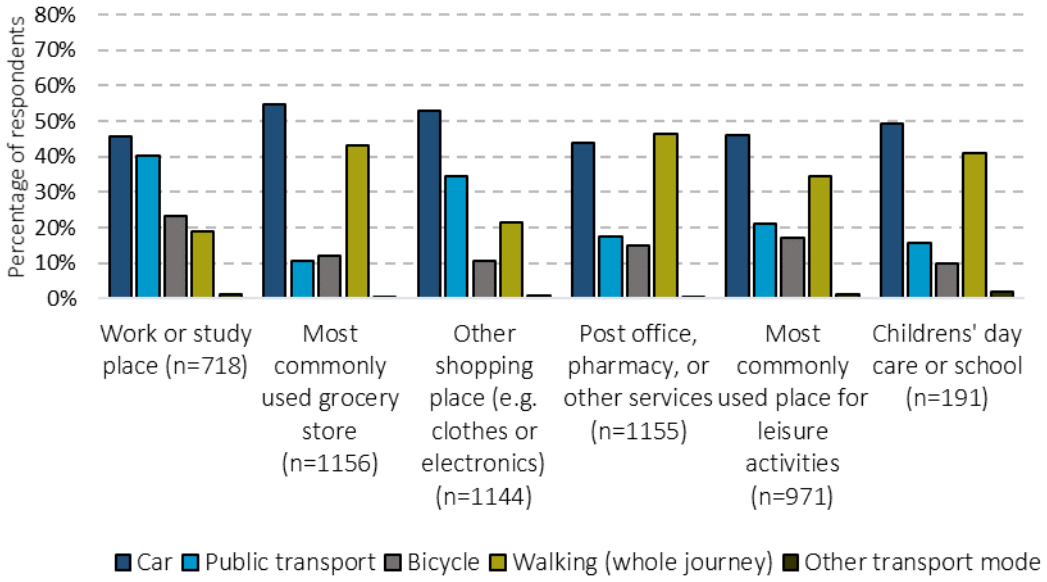

Figure 9. Respondents' use of travel modes on ordinary trips.

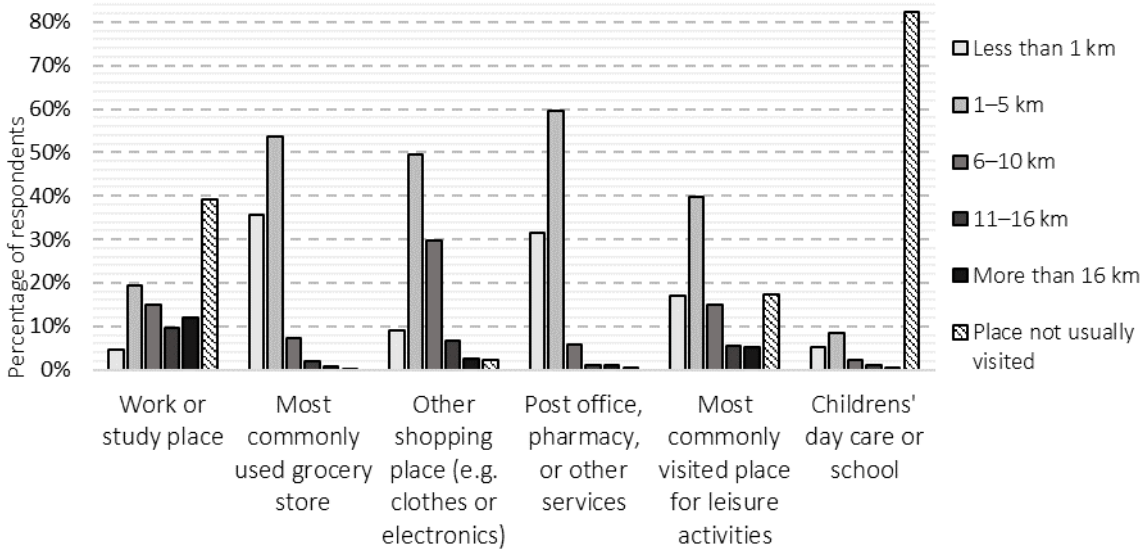

Figure 10. Respondents' distances from home to everyday places.

The respondents were asked whether they always use the same travel mode(s) for a particular trip, or select a travel mode each time depending on the situation. Forty-one per cent answered that they always use the same modes for the same trips and 59% that it varies with the situation.

The respondents who decide on a travel mode depending on the situation cited various factors that affect their choice when asked to describe it in their own words. Weather

conditions were often mentioned. Available time and personal schedules appear to be important in respondents' travel decisions, not just for one trip but possibly across several or even throughout the day. Some respondents said that they take into account whether they will have to make stops in several places. The availability, price and ease of parking was one issue that came up in many cases. Some respondents cited time spent at the destination as another factor affecting mode choice. Time of day also played a part, for example because of congestion. Time of year was also said to affect the choice of travel. Ticket fares mattered as well.

Many respondents said that the amount and weight of goods, such as luggage, groceries or equipment, affect their mode choices. A few also specifically mentioned travelling with pets. The impact of travel companions was frequently mentioned; respondents felt that they not only had to consider their own needs and preferences, but had e.g. family members to care for as well. Another factor was giving a ride to others or getting a ride, as was alternating use of a household car.

Quite a lot of respondents mentioned intoxicants, specifically alcohol, as a factor affecting mode choice. They said that if they had consumed alcohol or were planning to do so, they would take it into account when planning their trip. A few respondents also mentioned the car being serviced, holiday transport timetables, and disruptions to public transport factors that affect their mode choices.

Issues relating to mental resources came up surprisingly often. 'Feeling like taking the trouble', 'coping with everyday tasks' and 'vitality of the mind' were some of the expressions used. Desires and emotional states were also specified. State of health was brought up in general and more specifically, for example by referring to a particular trouble or disease. Some respondents said that the need or urge to exercise could affect their mode choices.

4.2.2. Travel preferences and priorities

Experience of pleasantness with different travel modes

The respondents were asked how pleasant they found different travel modes on a scale of 1 (very unpleasant) to 7 (very pleasant). The experienced pleasantness of a car, bus, train, bicycle, walking, metro, tram or shared taxi was quite different (Figure 11 & Figure 12).

Respondents who had no experience of a given travel mode or could not answer were excluded from the averages, thus the sample size varies between modes. A car was generally felt to be the most pleasant travel mode, with an average score of 6.0; the median was 6 and the most common value 7 (the highest). Walking had a high average for pleasantness, at 5.6, and although there was a bit more variation in the answers, the median and mode are similar to those for the car. Train and summertime bicycling both got an average of 5.2. The median for train pleasantness was 5 and mode 6, selected by 31% of the respondents. Summertime bicycling got more very pleasant and very unpleasant responses than train travel, and respectively fewer values in the middle. The median for summertime bicycling was 6 and mode 7.

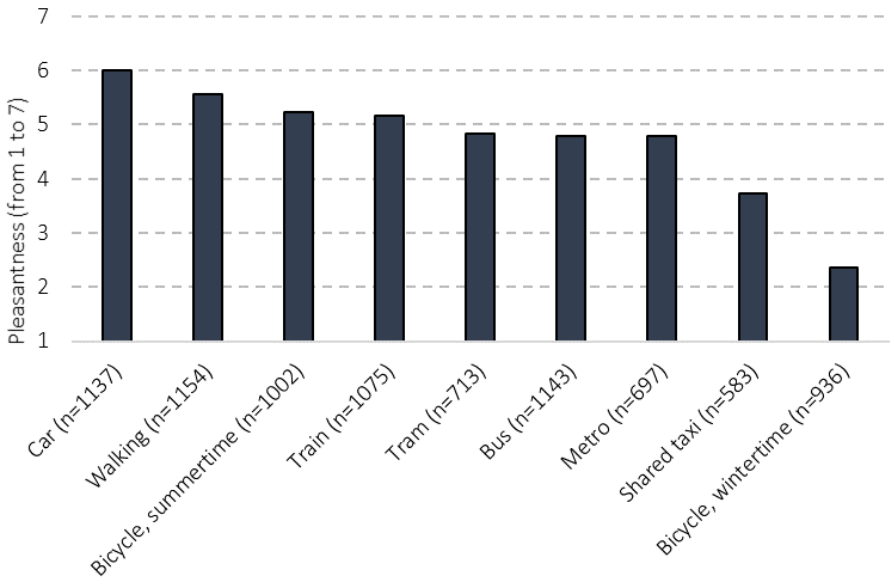

Figure 11. Average experienced pleasantness of travel modes.

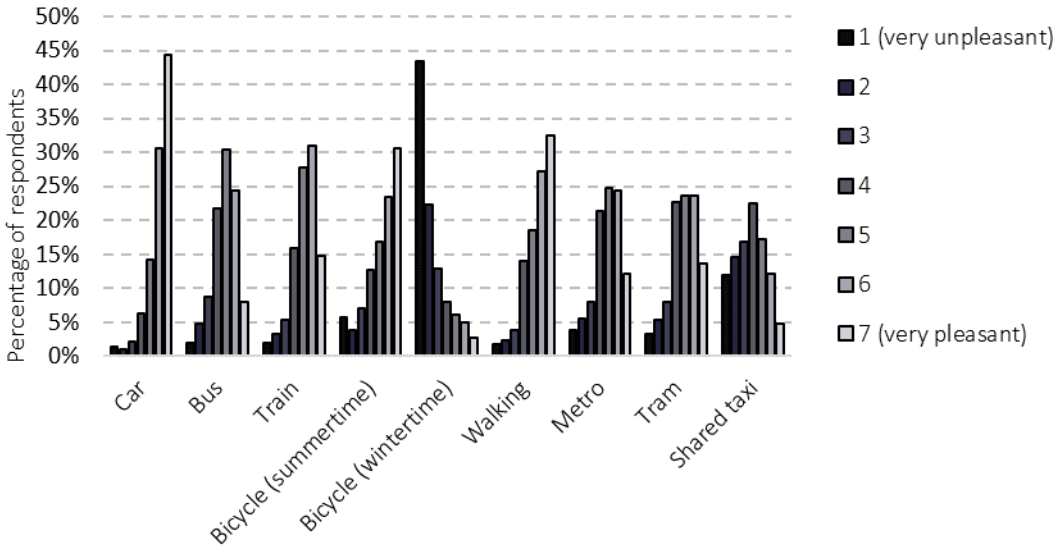

Figure 12. Distribution of experienced pleasantness of travel modes.

Travel by bus, metro and tram were experienced as somewhat less pleasant than by train. All got an average of 4.8 for pleasantness. The median and mode for pleasantness of both bus and metro were all 5. The pleasantness of taking a tram also got a median of 5, alongside the two most common values of 5 and 6. Compared to summertime bicycling, wintertime bicycling got a very low average, 2.4, for pleasantness; the most common value was 1, given by 43% percent of the answers, and median 2. Shared taxi had been included experimentally to get some hint of how pleasant people find a mode that has many of the same facilities and convenience as a car, but is shared with others. Half of the respondents were familiar with sharing a taxi and could assess its pleasantness. This mode was considered surprisingly unpleasant, getting an average of only 3.7, with the median and mode both being 4. Only 5% of the respondents experienced a shared taxi as very pleasant and 12% found it very unpleasant.

Importance of travel features and priorities for different trips

The importance of 16 features of travel was surveyed and analysed. The aim of this was to find out what is considered important in travelling and what features of undefined travel modes can influence travel decisions and mobility. The features included:

1) Low cost
2) Fastest mode
3) Freedom from transport timetables

4) Environment-friendliness
5) Possibility to drive oneself
6) As little walking as possible
7) Convenient boot space for goods
8) Private space (no strangers)
9) Possibility to focus on other things than driving
10) Convenience of taking children along
11) Reliability of transport mode
12) Safety of route
13) Pleasantness of route
14) Getting physical exercise
15) Not being outside in bad weather
16) Number of changes between vehicles.

The importance of these 16 features was asked concerning three kinds of trips: to the place of work or study, to the most commonly used grocery store, and to place most often used for leisure activities. The features were chosen based on the literature and specialist interviews. The respondents were asked to express the importance of the features on a scale of 1 (not at all important) to 9 (very important). There was also a 'cannot tell' option. In the case of work and study trips, only respondents who work or study were asked to reply. Next, the respondents were asked to choose the three most important features for each trip type, in order to get them to prioritise.

The importance of the features varies, some of them being considered much more important to the respondents regardless of trip type (Figure 13). The importance also seems to differ between trips, when examining the average importance for different trip types. For calculation of averages, respondents who chose the 'cannot tell' option were excluded. In the case of feature number 10 (convenient to take children along), the importance was counted only for respondents who had under 18-year-old children in their household (n = 247 respondents). Reliability of the transport mode was valued highly, with at least 7 on average, for each trip type. It was most important on a trip to work or place of study. For example, travelling with the fastest mode, low cost and possibility to focus on other things than driving were also most important on work or study trips. This could relate to respondents' trips to work or study being longer and more frequent than to the grocery store or place of leisure, and involving walking less often. Thus features like costs and travel time would become more important. Trips to the grocery store were also made more often by walking, when cost is perhaps not considered a relevant issue. The importance of

reliability may relate to timetables being less flexible when going to work than to the grocery store or place of leisure. On a trip to the grocery store, having a convenient boot space for goods is more important (average 6.0) than on other trips (averages 4.5 and 4.3). Having to walk as little as possible is also slightly more important on grocery trips than on other trips.

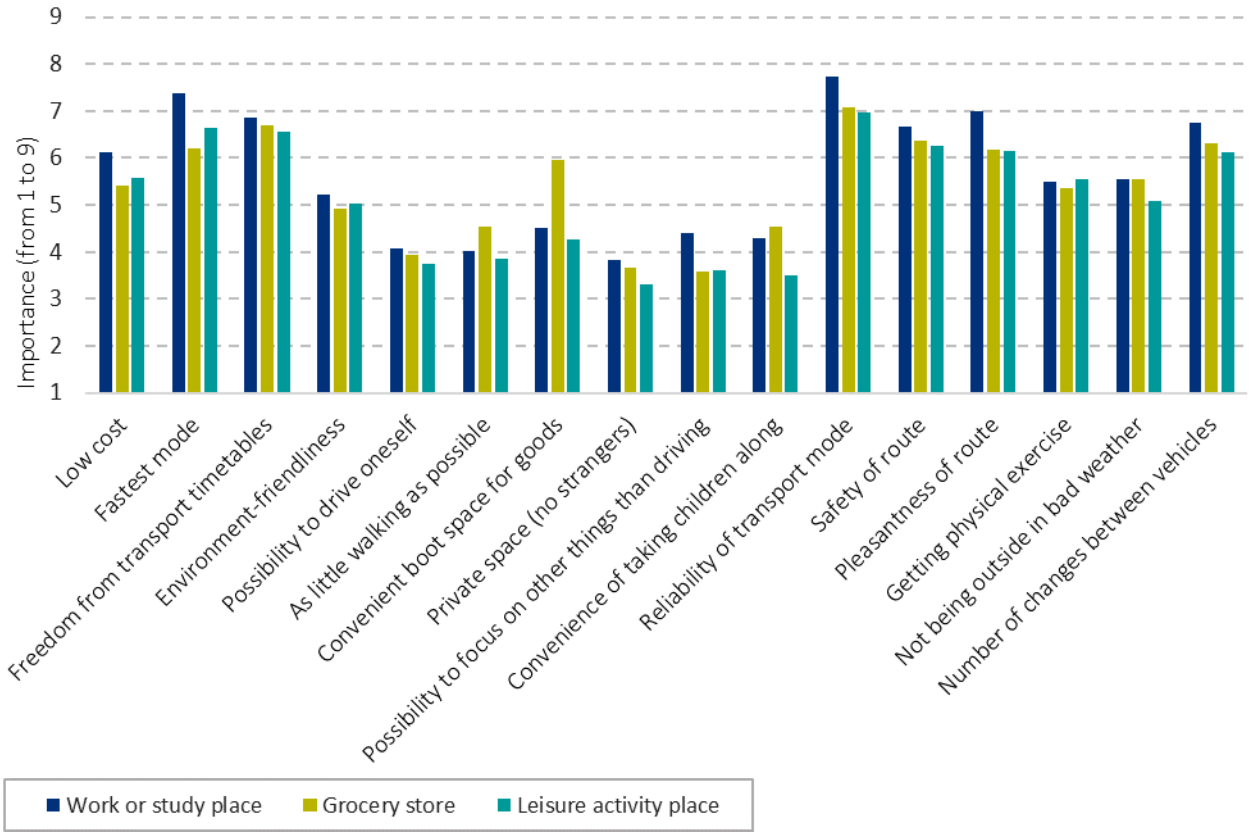

Figure 13. Average importances of the 16 features on different trips.

Looking at features prioritised as the three most important, it is clear that different features are important to different people (Table 2). Note here that all respondents, not only those living with children, answered on the convenience of taking children along. Every feature was found at least by someone to be one of the three most important. On a trip to work or study, the most common feature in the top three was 'fastest mode', with 54% of respondents selecting it. 'Reliability of transport mode' came second, with 41% of respondents choosing it. 'Freedom from transport timetables' came third with 34% and 'low cost' fourth with 28%.

On a grocery trip, the most commonly chosen feature was 'convenient boot available for goods', with 43% of respondents choosing it as one of their three most important features.

Being 'free from transport timetables' came second in importance for 38% of the respondents. 'Fastest mode' only came third, with 34% percent of respondents choosing it for a trip to the grocery store. Fourth was 'getting physical exercise', which was chosen by slightly more than a quarter of the respondents. On a trip to a place of leisure, 'fastest mode' was the most commonly chosen feature, selected by 42% of the respondents. 'Freedom from transport timetables came second and 'reliability of transport mode' third.

Table 2. Features chosen as the three most important on different trips.

	Work or study place		Grocery store		Leisure activity place	
Feature	Ranking	Percentage of respondents putting the feature into the top three	Ranking	Percentage of respondents putting the feature into the top three	Ranking	Percentage of respondents putting the feature into the top three
Low cost	4	28%	5	23%	5	24%
Fastest mode	1	54%	3	34%	1	42%
Freedom from timetables	3	34%	2	38%	2	35%
Environment-friendliness	9	12%	13	8%	11	8%
Possibility to drive oneself	13	8%	12	9%	12	7%
As little walking as possible	14	7%	8	16%	13	7%
Convenient boot space for goods	10	9%	1	43%	7	15%
Privacy (no strangers)	15	6%	16	4%	15	4%
Possibility to focus on other things than driving	8	14%	14	5%	14	6%
Convenient to take children along	16	5%	15	5%	16	3%
Reliability of transport mode	2	41%	6	23%	3	29%
Safety of route	11	9%	10	12%	7	15%
Pleasantness of route	12	9%	9	12%	10	11%
Getting physical exercise	5	26%	4	26%	4	25%
Not being outside in bad weather	6	18%	7	21%	6	16%
Number of changes between vehicles	7	14%	11	12%	9	13%

Some features relate more closely to a car as the travel mode, some to public transport, and others to bicycling or walking. They may also describe newer modes or means of travel. For instance, convenient boot space, privacy and the possibility to drive oneself relate to the car as a travel mode today, but the possibility to focus on other things than driving is a feature brought about with automation. Some features have a highly subjective interpretation; for instance, 'low cost' may mean different things to different people.

The top priorities listed by active users of a car, public transport or bicycle were compared with those of other respondents. Active user groups were defined as people who use the specific mode daily or almost daily in summer, winter or both. Thus, active car users are respondents who drive a car daily or almost daily; active public transport users ride on public transport daily or almost daily, and active cyclists use their bicycles daily or almost daily. Only active car users who drive themselves were included. The comparisons were made one at a time, comparing active users with non-active users of each specific mode. Hence, one respondent may belong to more than one active user group. The importance of each feature is taken as the average of the values 1–9 given to the top three trips. In the case of respondents who did not work or study, the average is for the top two. For each feature, respondents who selected 'I can't say' in regard to a feature's importance on one or more trips were excluded from the analysis. Thus *n* varies between the features. The Kruskal-Wallis test was used to assess significant differences between groups because it does not require normal distribution. The results show that active car drivers, active users of public transport and active cyclists do find different features important in travel compared to respondents who were non-active users of these modes (Table 3).

Table 3. Priorities of active users of a car, public transport and bicycle compared to priorities of non-active users. The scale was from 1 (not at all important) to 9 (very important). Kruskal-Wallis test results are significant at the level of 0.05.

Feature	Significant difference between active car drivers (n = 527) and others (n = 636)	Significant difference between active public transport (PT) users (n = 356) and others (n = 807)	Significant difference between active cyclists (n = 273) and others (n = 890)	Description
Low cost	Yes $x^2 = 110.01$	Yes $x^2 = 26.57$	Yes $x^2 = 43.83$	Active car drivers find low cost less important than other

(n = 1139)	Median of active drivers = 5.00 and of others = 7.00	Median of active PT users = 6.67 and of others = 5.50	Median of active cyclists = 7.00 and of others = 5.33	respondents do. Active PT users and cyclists find it more important compared to other respondents.
Fastest mode (n = 1149)	Yes $x^2 = 50.74$ Median of active drivers = 7.67 and of others = 6.50	No	Yes $x^2 = 9.39$ Median of active cyclists = 6.67 and of others = 7.33	Active car drivers find the fastest mode more important than other respondents do. Active cyclists find it less important than other respondents do.
Freedom from transport timetables (n = 1146)	Yes $x^2 = 60.81$ Median of active drivers = 7.67 and of others = 6.50	Yes $x^2 = 82.18$ Median of active PT users = 6.00 and of others = 7.67	Yes $x^2 = 7.56$ Median of active cyclists = 7.00 and of others = 7.33	Active car drivers find being free from transport timetables more important than other respondents do. Active PT users find it less important compared to other respondents. Active cyclists find it slightly less important than other respondents do.
Environment-friendliness (n = 1129)	Yes $x^2 = 52.90$ Median of active drivers = 4.58 and of others = 5.50	Yes $x^2 = 13.72$ Median of active PT users = 5.67 and of others = 5.00	Yes $x^2 = 62.03$ Median of active cyclists = 6.33 and of others = 5.00	Active car drivers find environment-friendliness less important than other respondents do. Active PT users and cyclists find it more important compared to other respondents.
Possibility to drive oneself (n = 1133)	Yes $x^2 = 343.98$ Median of active drivers = 5.52 and of others = 1.00	Yes $x^2 = 184.70$ Median of active PT users = 1.00 and of others = 5.00	Yes $x^2 = 7.73$ Median of active cyclists = 2.33 and of others = 3.50	Active car drivers find the possibility to drive oneself more important than other respondents do. Active PT users and cyclists find it less important compared to other respondents.
As little walking as possible (n = 1151)	Yes $x^2 = 16.07$ Median of active drivers = 4.49 and of others = 3.67	No	Yes $x^2 = 27.07$ Median of active cyclists = 3.33 and of others = 4.33	Active car drivers find as little walking as possible to be more important than other respondents do. Active cyclists find it less important compared to other respondents.
Convenient boot space for goods (n = 1132)	Yes $x^2 = 228.69$	Yes $x^2 = 134.16$	Yes $x^2 = 49.55$	Active car drivers find having convenient boot space more important than other respondents do. Active PT users

	Median of active drivers = 6.67 and of others = 3.67	Median of active PT users = 3.67 and of others = 6.00	Median of active cyclists = 4.00 and of others = 5.50	and cyclists find it less important compared to other respondents.
Privacy (no strangers) (n = 1136)	Yes x^2 = 137.23 Median of active drivers = 4.33 and of others = 2.00	Yes x^2 = 94.56 Median of active PT users = 1.67 and of others = 3.67	Yes x^2 = 22.99 Median of active cyclists = 2.33 and of others = 3.00	Active car drivers find privacy more important than other respondents do. Active PT users and cyclists find it less important compared to other respondents.
Possibility to focus on other things than driving (n = 1106)	Yes x^2 = 97.37 Median of active drivers = 2.67 and of others = 4.50	Yes x^2 = 86.28 Median of active PT users = 5.00 and of others = 3.00	No	Active car drivers find the possibility to focus on other things than driving less important than other respondents do. Active PT users find it more important compared to other respondents.
Convenient to take children along (n = 229)	Yes x^2 = 11.25 Median of active drivers = 4.83 and of others = 2.67	Yes x^2 = 5.31 Median of active PT users = 3.33 and of others = 4.33	No	Active car drivers find the convenience of taking children along more important than other respondents do. Active PT users find it slightly less important compared to other respondents. Note: Only respondents with under 18-year-old children in their household were included (243 respondents).
Reliability of transport mode (n = 1148)	Yes x^2 = 5.11 Median of active drivers = 7.67 and of others = 7.50	No	Yes x^2 = 4.65 Median of active cyclists = 7.33 and of others = 7.67	Active car drivers find the reliability of transport slightly more important than other respondents do. Active cyclists find it slightly less important compared to other respondents.
Safety of route (n = 1137)	No	No	No	No significant differences between active users and others.
Pleasantness of route (n = 1149)	No	No	No	No significant differences between active users and others.
Getting physical exercise (n = 1142)	Yes x^2 = 90.64	Yes x^2 = 4.77	Yes x^2 = 111.40	Active car drivers find getting physical exercise less important than other respondents do. Active PT users as well as active

	Median of active drivers = 4.67 and of others = 6.33	Median of active PT users = 6.00 and of others = 5.33	Median of active cyclists = 7.00 and of others = 5.00	cyclists find it more important compared to other respondents.
Not being outside in bad weather (n = 1144)	Yes $x^2 = 78.35$ Median of active drivers = 6.67 and of others = 5.00	Yes $x^2 = 4.27$ Median of active PT users = 5.33 and of others = 5.67	Yes $x^2 = 59.95$ Median of active cyclists = 4.33 and of others = 6.00	Active car drivers find not being outside in bad weather more important than other respondents do. Active PT users and cyclists find it less important compared to other respondents.
Number of changes between vehicles (n = 1106)	Yes $x^2 = 20.30$ Median of active drivers = 7.50 and of others = 6.50	No	Yes $x^2 = 9.96$ Median of active cyclists = 6.33 and of others = 7.00	Active car drivers find the number of changes more important than other respondents do. Active cyclists find it less important than other respondents do.

The differences between active and non-active users of the three modes can be summarised as follows: Active car drivers on average considered the following features of daily travel to be more important compared to non-active drivers: travel by the fastest mode, freedom from transport timetables, the possibility to drive themselves, walking as little as possible, the convenience of taking children along, convenient boot space, privacy, reliability, not having to be outside in bad weather, and the number of changes between vehicles. Features found to be less important compared to non-active drivers were low cost, environment-friendliness, possibility to focus on other things than driving and getting physical exercise.

Active public transport users appreciated low cost, environment-friendliness, the possibility to focus on other things than driving and getting physical exercise more than did other respondents. Active public transport users found being free from transport timetables, the possibility to drive themselves, convenient boot space, privacy, the convenience of taking children along, and not having to be outside in bad weather less important features than those not using public transport actively.

Active cyclists found getting physical exercise, low cost and environment-friendliness more important than respondents who were not riding a bicycle actively. Travelling by the fastest mode, walking as little as possible, convenient boot space and not having to be outside in bad weather were less important to cyclists than to others. Also, freedom from transport

timetables, the possibility to drive themselves, privacy, the number of changes between vehicles and reliability were considered slightly less important by cyclists than by other respondents.

4.2.3. Mobility constraints

Most of the respondents (71%) reported being pleased with the amount of travel in their daily life. However, 21% of respondents said that they would be willing to visit more places in their daily life if possible. Four per cent of the respondents said that they would like to travel less than they currently have to in their daily life. Four per cent could not tell.

The respondents were asked when was the last time they had thought of going somewhere in their daily life but then did not go. Nine per cent answered 'today', 31% 'this week' and 23% 'this month'; 14% said that they always visit the places they intend to visit, and 23% could not remember. The 728 respondents who did remember a trip that they had not put into practice were asked to give a main reason for not going; they could state up to three that best described their situation. The most common reason, given by 41% of respondents, was postponement of the trip to another time (Table 4). Almost a third (30%) of respondents said they did not have the time. The two next common reasons were both given by 24% of the respondents: "It would have required too much energy, so I didn't bother" and "I did not have to go or did not feel like going anyway".

Table 4. Reasons for not making the planned trip.

Reason	Percentage of respondents
I postponed the trip to another time	41%
I did not have time	30%
It would have required too much energy, so I didn't bother	24%
I did not have to go or I did not feel like going anyway	24%
I had responsibilities at home	18%
Other reason	15%
Travelling is too expensive	4%
No suitable vehicle or travel mode was available to me	4%

I could run an errand more easily in another way, e.g. by phone or on the Web	3%
Someone else ran the errand for me	2%

Next, the respondents were asked about mobility constraints at a more general level. Six possible daily mobility-restricting factors were specified in the question and rated on a scale of 1 (not at all) to 7 (very much). Only extreme scores were named in the questionnaire. The specified factors were lack of time, lack of money, low energy or difficulty coping, safety concerns, lack of a suitable vehicle, and physical disabilities. The factors were considered personal and to relate only to the respondent's own mobility resources. Scores 2–4 were interpreted to indicate little or some restrictive effect and scores 5–7 a fairly high or very high restrictive effect. It is significant that even though most respondents said they were pleased with the amount of daily travel in their life, only 100 of the 1163 felt that none of the six factors restricted their daily mobility even slightly.

Low energy or difficulty coping was the most common factor experienced as restricting daily mobility (Figure 14). As many as 82% of the respondents felt that it restricts their mobility at least slightly (score 2–4), and 34% felt that it does so quite a lot or very much (score 5-7). The average score was 3.5. The second commonest factor restricting mobility was lack of time. Of the respondents, 65% said that it restricts their daily mobility at least a little, and 32% quite a lot or very much. The average score was 3.2. Lack of money was a restrictive factor for 63% of the respondents, and 23% found it to be a somewhat or very restrictive factor. Most of the respondents did not find safety concerns, lack of a suitable vehicle or physical disabilities to be at all restrictive for their daily mobility, but these factors were crucial to some. Physical disabilities were quite or very restrictive to 7% of the respondents, lack of a suitable vehicle to 8% and safety concerns to 7%.

Experiencing lack of time as a mobility-restricting factor was interconnected with the respondent's work situation (Table 5). Working respondents, students and mothers or fathers staying at home found lack of time to restrict their daily mobility significantly more than retirees or those who were unemployed.

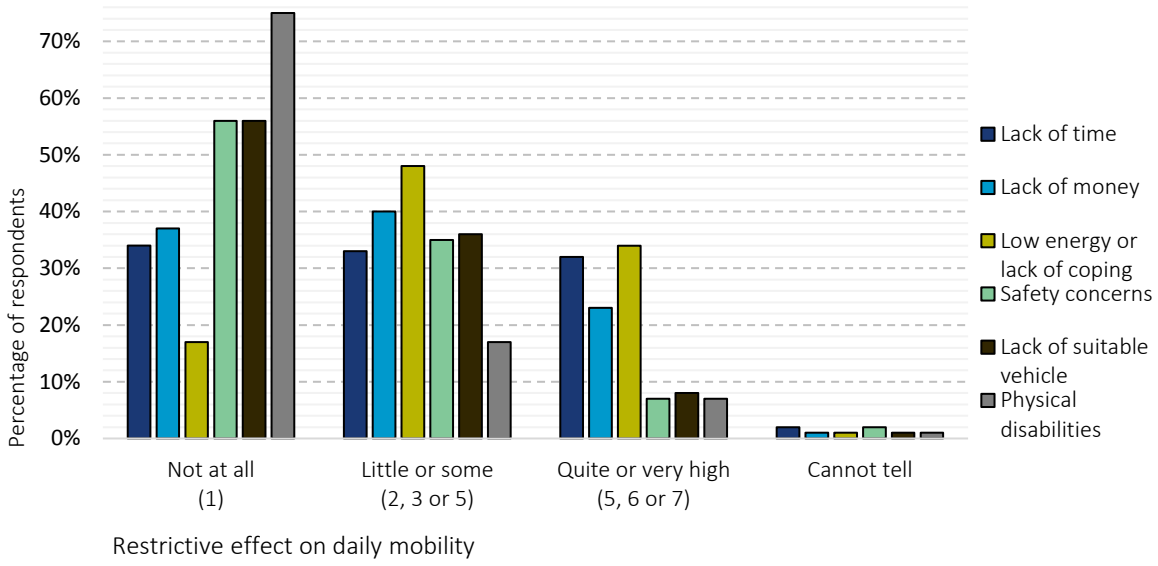

Figure 14. Personal constraints of daily mobility.

Table 5. Restrictiveness of lack of time on the daily mobility and work situation of respondents.

	Working (n = 648)	Student (n = 91)	Retiree (n = 308)	Stay-at-home mother/ father (n = 12)	Unemployed (n = 84)	Total (n = 1143)
Not at all (1)	25%	11%	58%	16%	44%	34%
Little or some (2-4)	31%	43%	32%	42%	19%	32%
Quite or very high (5-7)	43%	46%	9,1%	42%	19%	33%
Total	100%	100%	100%	100%	100%	100%

Significant at the level of 0.01. 20.0 % of the cells had expected count less than 5.

In addition to work situation, living in a household with under 18-year-old children was significantly interrelated with experiencing of lack of time as restricting daily mobility. At the significance level of 0.01, 54% of respondents sharing a household with minors said that lack of time restricted their daily mobility quite a lot or very much, compared with 27% of those not living in such a household.

Unsurprisingly, lack of money was a crucial mobility-restricting factor more often for respondents with a lower household income than for those with a higher one (Table 6). Almost a half (46%) of respondents with a household income of €20 000 or less felt that lack of money restricted their daily mobility quite a lot or very much. In this income bracket, only

18% of respondents did not feel at all restricted in their daily mobility due to lack of funds. In contrast, 51% of those with a household income of over €60 000 did feel thus restricted.

Table 6. Restrictiveness of lack of money on daily mobility and household income of respondents.

	€0–20000 (n = 140)	€20001–40000 (n = 285)	€40001–60000 (n = 246)	Over €60000 (n = 358)	Total (n = 1036)
Not at all (1)	18%	29%	40%	51%	38%
Little or some (2-4)	36%	41%	40%	39%	40%
Quite or very high (5-7)	46%	30%	20%	10%	23%
Total	100%	100%	100%	100%	100%

Significant at a level of 0.01.

Low energy or inability to cope was found to be related to lack of time as a mobility-restricting factor (Table 7). Most of the respondents experienced a restrictive effect of both lack of time and low energy or inability to cope. A small number of respondents found lack of time to restrict their daily mobility but not low energy or poor coping ability. However, some respondents felt that lack of time was not at all restricting to their daily mobility, but low energy or poor coping was.

Table 7. Restrictiveness of lack of time and restrictiveness of low energy or inability to cope.

		LACK OF TIME			
		Not at all (1)	Little or some (2-4)	Quite or very high (5-7)	Total
LOW ENERGY OR INABILITY TO COPE	Not at all (1)	13%	2%	2%	17%
	Little or some (2-4)	15%	22%	12%	49%
	Quite or very high (5-7)	6%	8%	19%	34%
	Total	34%	33%	33%	100%

Significant at the level of 0.01. n=1042.

Low energy or inability to cope was interrelated with many factors. As with lack of time, it was related to the work situation at a significance level of 0.01. Retired respondents again experienced less of a mobility-restrictive effect caused by low energy or poor coping ability.

However, unemployed respondents, who in general found lack of time to be far less restrictive than did working respondents, felt that low energy or inability to cope were almost as restricting as for working respondents.

Experiencing low energy or inability to cope as a restrictive factor was significantly related, at a level of 0.01, to having under 18-year-old children in the same household. Respondents living with minors experienced that low energy or poor coping ability restricted their daily mobility quite a lot or very much in 46% percent of cases, compared with 31% of those not living in such a household. The restrictiveness of low energy or inability to cope was also significantly interrelated, at a level of 0.01, with both age and household income. Under 35-year-old respondents experienced low energy or inability to cope as restricting their mobility the most, and over 64-year-old respondents felt it the least. Respondents with a higher household income found low energy or inability to cope as a mobility-restricting factor less often than respondents living in lower-income households. It should be kept in mind that younger respondents in the sample were also getting lower household incomes and most probably had small children.

Taking the three restrictiveness levels together, no significant difference was found between male and female respondents in relation to lack of time. By contrast, the restrictiveness of low energy or poor coping ability was experienced significantly more by women than men. At a significance level of 0.01, 30% of men found it to be quite or very mobility-restrictive compared with 38% of women.

Having disabilities or a condition affecting daily travel was related to experiencing safety concerns as a mobility-restricting issue. Among respondents with a mobility-affecting disability or condition (9% of the sample), the restrictiveness of safety concerns differed significantly, at a level of 0.01, from that experienced by respondents with full physical travel capability. Of all respondents, 7% said that safety concerns restricted their daily mobility quite a lot or very much, compared with 17% of those with some mobility-affecting disability or condition. The restrictiveness of safety concerns on daily mobility did not differ significantly between age groups, even though there seemed to be some difference. It was not significant when comparing under 65-year-old respondents with those aged 65 years or more. The relation of mobility-restrictive safety concerns to gender was examined, but although there seemed to be a slight relation, no significant difference was found. Nor was

a significant difference found in safety concerns between respondents with different household incomes.

The mobility-restrictiveness of lack of a suitable vehicle was significantly interrelated with not having a car in the household. At a significance level of 0.01, 62% of respondents with a household car did not feel restricted by lack of a suitable vehicle, compared with 40% of respondents without a household car. Those who did feel restricted either quite a lot of very much were respectively 6% and 15%.

As expected, the restrictiveness of physical disabilities on daily mobility was significantly higher among respondents who reported having a mobility-restricting disability or condition, at a significance level of 0.01. Of these, 37% felt that their disability restricted their daily mobility a little or somewhat, and 57% quite a lot or very much. In addition, age and the mobility-restrictiveness of physical disabilities were significantly interrelated at a level of 0.01 when comparing under 65-year-old respondents with those aged 65 years or more. Whereas 5% of all respondents felt that physical disabilities restricted their daily mobility quite a lot or very much, among those aged 65 years or more the share was 10%.

5. Discussion

5.1. Mobility consists of personal variables, situation-specific and environment-related factors, decision-making processes and realised travel

Changes in the transport environment, research and policy require a deeper understanding of human mobility that goes beyond descriptive data about past or present travel. This work was designed to take a step towards a more comprehensive understanding of human mobility and to bring this understanding closer to practice. The work introduced a multidisciplinary approach to mobility by reviewing the literature and interviewing specialists. The approach is based on the premise that mobility is subjective travel potential, in which realised travel takes place.

As discussed by multiple researchers, mobility is more than travel. It can be defined as the potential for movement (Spinney et al. 2009; Gudmundsson 2005), the ability to move (Hanson 1995), or ease of movement (Sager 2006). Realised travel happens within mobility (Spinney et al. 2009). However, if mobility is the potential for travel, what does this potential consist of? The first research question of the work was: *what does mobility consist of?*

This work showed that mobility consists of multiple variables, which were specified more closely in the mobility model based on the literature and specialist interviews. First, personal variables, namely individual background, life situation, personality, identity, preferences, needs, resources and routines directly shape the travel potential, in other words mobility. These personal variables, together with the environmental variables, generate, enable and constrain travel. Background and life situation affect the needs and resources that people have in their life. Consequently, it is natural that socio-demographic factors have been found to relate to travel decisions (e.g. Wu et al. 2015; Tuominen et al. 2007). Individuals have different kinds of more or less important needs, which are prioritised all the time and which shape travel and its potential. The variety of travel-related needs was recognised, for example, by Kellerman (2016). The impact of habitual behaviour on travel is reflected in the research by Carreno and Welsh (2009), Oullette & Wood (1998) and others. Personal resources specified in the mobility model include time, money, physical abilities and mental resources. As was reasoned by Spinney and others (2009), mobility is conditioned by the mobility tools one knows about, has access to and is willing to use. Knowing and being able

to use require physical ability and mental resources, such as cognitive skills or general coping, from an individual. These resources are also reflected in the theory by Norros (2004), which stated that taking environmental constraints into account and balancing between them requires skill, knowledge and collaboration.

Personality, identity and preferences impact an individual's actions and experiences related to travel. Because subjective experiences are a major factor in the mobility concept (Hakonen 2011; Button et al. 2006; Gudmundsson 2005), mobility cannot be considered properly without taking the subjective matters and experiences into account.

Humans are not always rational beings (Thaler and Sunstein 2008; Gärling & Axhausen 2003), and thus individual decision-making is a relevant part of mobility. Personal variables, along with situation-specific and environmental factors, affect the decision-making process. The decision-making variables, specified in the mobility model, include three aspects. Willingness and ability to compromise relate to the preferences and priorities that an individual has. Among others, Vij et al. (2013) have shown that people have preferences for certain travel modes. Whereas ability to compromise is tied to the resources one has in use, willingness to compromise refers to the preferences and priorities one has for travel and other activities.

People also perceive situations and alternatives differently. For instance, it is shown that people perceive time differently (Li 2003). In the context of mobility, individuals may have different opinions about what trips require from them and what trips are feasible (Sager 2006). Thus, estimation of costs and benefits, meaning not only monetary but generally any costs and benefits derived from travel, is tied to individual perceptions.

Decision-making can lead to realised travel, which is the part of mobility that can be measured the most easily. Travel characteristics include variables related to the amount of travel, travel patterns and trip quality. These were identified earlier by Innamaa and others (2013). Amount of travel and travel patterns include objective measures like the number of trips, mode choice and the length or duration of trips. Trip quality is tied to the personal experience of stress or feelings of safety or comfort.

These variables were concluded to be the most relevant ones from which mobility consists. The mobility model's focus is on individual mobility. Where the model specifies personal mobility-related issues, it discusses environment-related factors quite superficially. The

mobility model itself does not suggest methods for researching the identified parts of mobility, but presents what factors should be considered when trying to understand human mobility beyond realised travel.

5.2. Reliability and rapidity priorities on work trips; boot space and freedom from timetables important on grocery trips

In the second part of the work, specific variables of mobility were studied empirically by conducting a survey in five cities. The variables studied were personal resources, willingness and ability to compromise, and perception of opportunities and constraints. Within these variables, the survey analyses focused on individual preferences, in terms of comfort and travel features, resources and constraints of daily mobility. In this and the following chapter, the second research question of the work is discussed: *What preferences and priorities do people have in daily travel?*

The survey results showed that when the respondents were asked to rate the importance of sixteen travel features, some features were considered generally more important than others. Reliability, rapidity and freedom from transport timetables stood out as highly valued travel features on average. Safety and pleasantness of the route as well as number of changes between vehicles were considered important, but when the respondents were asked to prioritise three features only, they were selected a lot less than reliability, rapidity and freedom from timetables.

The features were also valued differently on trips to the place of work or study, grocery store or leisure activity. The three most important features on a trip to work or place of study were rapidity, reliability and freedom from transport timetables. On a trip to a leisure activity, the same three features were considered most important. On a grocery store trip, reliability was not that important, whereas convenient boot space for goods rose to the top three along with rapidity and freedom from transport timetables. Having to walk as little possible was another feature considered more important on a grocery store trip than on the other two.

The reasons for these differences are quite understandable. On a trip to the place of work or study one is generally expected to be on time, which makes the reliability of travel crucial. This may also be true of a leisure activity, which may be limited to a particular time.

Obviously, leisure activities and their characteristics vary. Buying groceries is not typically very time-specific, thus small delays may not be a big issue. However, groceries are often heavy, and people may not want to or be able to carry them home, in which case adequate boot space and minimal walking are appreciated. The low cost of a trip is more important when going to work or study than to a grocery store or leisure activity. There may be many reasons for this, one being that trips to work or study are often longer. This was the case among the respondents. The frequency and length of work-related trips may cause significant monetary expenditure. In contrast, a trip to the grocery store or leisure activity often involves more walking and less travel than to work, thus the cost is not considered that relevant. The possibility to focus on other things than driving was also considered more important on work and study trips than on grocery and leisure trips, probably for the same reasons of length and frequency.

It should be kept in mind that the travel features were ready-defined for the respondents. There can be other important features in travel that were not included. However, the survey results indicate that the needs and preferences for different trips vary, and this was demonstrated in the mobility model as well. The varying of travel behaviour on different trips has been researched by Schlich and Axhausen (2003), who concluded day-to-day travel behaviour to be more variable if measured with trip-based methods. The result that prioritisation of travel features varies on different trips supports their findings, and it could for its part give an explanation for them. Klöckner & Friedrichsmeier (2011) noted that situation-specific aspects affect travel decisions. The travel features provided by different travel modes respond to the preferences and needs that people have. Since the situations are often dissimilar on different types of trips, it seems rational that prioritisation of travel features varies as well.

5.3. Car drivers value different features of travel than do public transport users

Differences in the importance of various travel features also emerged when comparing active users of three travel modes to non-active users of the same modes. The results showed that the prioritisations of active car drivers, active public transport users and active cyclists differed from other respondents' priorities. Active car drivers generally considered rapidity, reliability, freedom from transport timetables, possibility to drive, avoiding walking, having convenient boot space, privacy, avoiding the outdoors in bad weather and avoiding

changes between vehicles to be more important than did non-active car drivers. In turn, low cost, environment-friendliness, possibility to focus on other things than driving and getting physical exercise were felt to be less important by active car users than by non-active drivers. Active users of public transport considered low cost, environment-friendliness, possibility to focus on other things than driving and getting physical exercise to be more important than did non-active users of public transport. In turn, the possibility to drive oneself, needing to walk as little as possible, convenient boot space and privacy were less important to active public transport users than to the other respondents. When it came to active cyclists, they considered low cost, environment-friendliness and getting physical exercise to be more important than did non-active cyclists.

Although social connotation and habitual behaviour (Paulssen et al. 2014; Carreno and Welsh 2009) influence mode choice, the survey results suggest that it is also tied to the features that the mode offers to the user. Different prioritisations of active mode users compared to other respondents indicate that while different things are important for individuals in general, people use certain travel modes for the features they offer. People use certain travel modes for various reasons, not always because they are available or the fastest or cheapest alternatives.

It has been shown that people can be divided into groups based on their background and attitudes towards different travel modes (Frost et al. 2013). The results of this work indicate that mode choice is affected by individual preferences for specific features as well. As we know, people have preferences for certain travel modes that they find most attractive (Vij et al. 2013; Van Wee et al. 2002), and it is valuable to understand these preferences more specifically. By knowing which travel features are important to whom, it is possible to understand better the premises on which people make their travel decisions. Further, better planning and more efficient policies could be practised. The feature-specific information about people's preferences is to some extent independent of traditional travel modes, and could thus be used in considering new or future travel modes or services as well. It has been declared that the age of transport-demand management especially embraces understanding of people's travel behaviour and needs (Lyons & Urry 2005; Axhausen et al. 2002) and requires knowing the status quo well (Ministry of Transport and Communications 2016). Thus, the method of identifying features instead of modes alone could partially respond to the needs of smarter demand management.

5.4. Mobility constraints are tied to personal resources

The third research question of this work was: *which constraints restrict daily mobility?* Realised travel happens within mobility (Spinney et al. 2009), and mobility is constrained by multiple things. The constraints of mobility are discussed in this and the following chapters.

Multiple constraints were experienced to restrict the respondents' mobility. It is natural that travel, like any daily practice, would be constrained by the finite resources one has in use. The constraints of mobility can shape it in many ways. Supposedly, constraints can sometimes prevent travel, but they also call for the individual to make compromises on how to travel. Thus, constraints can impact both the amount and patterns of travel.

Most of the respondents, over 70%, said that they were pleased with the amount of travel they had in their daily life; 25% said they were not. Still, over 90% felt restricted by at least one of the six factors defined—lack of time, lack of money, low energy or inability to cope, safety concerns, lack of a suitable vehicle or physical disabilities.

Of the respondents, 65% felt that lack of time restricts their daily mobility to some extent. A finite amount of time is a major restrictive factor in mobility, and this is in line with earlier conclusions (Li 2003). Lack of money was at least a slightly restrictive factor for 63% of the respondents. Safety concerns, lack of a suitable vehicle and physical disabilities were not restrictive for most of the respondents, but for some they were crucial mobility constraints. The restrictive effect of low energy or inability to cope was experienced by as many as 82% of the respondents. The result of mental resources having a remarkable impact on mobility is discussed more specifically in the following chapter.

Analysis of daily mobility constraints revealed that the mobility constraints experienced in everyday life are related to background variables such as life situation, income, gender, disabilities, age, work situation, children and car ownership. Because the survey sample was limited and there were dependencies between some of these background variables, these interdependencies would need to be researched further for credible generalisations. Despite that, the results support earlier findings that travel is closely related to demographic and socioeconomic factors. The results showed that work situation was related to experiencing lack of time as a mobility-restricting factor. Those who worked, studied or were

taking care of children at home were more constrained by lack of time than were retired or unemployed respondents. Household income and restrictiveness of a lack of money were dependent on each other as well. It has been said that there is an interdependency between socio-economic factors and the travel priorities of people. For instance, Susilo and Cats (2014) listed a set of the most important needs and most determining characteristics associated with different groups of travellers. They concluded, for instance, that key factors for workers employed full-time include punctuality, reliability and cost. Because full-time employment brings on more temporal constraints, also Li (2003) has argued that reliability and punctuality are more crucial to commuters than cost. Age-related disabilities and accessibility problems have been discussed in multiple studies (e.g. Hjorthol 2013; Lehmann et al. 2013). Because the personal resources that enable travel (time, money, physical abilities and mental resources) are closely related to sociodemographic background and life situation, it seems reasonable that the constraints experienced are related to them as well.

When the respondents were asked to recall the last time they had planned a trip but not put it into practice, the vast majority were able to recollect such an event. When the reasons were asked, the most common one given (41% of the respondents) was postponement to another time. This indicates that some constraint may have affected the timing of travel. It could also indicate that if a person plans a trip and can remember it later, the trip most probably is of some importance to them. The second most common reason was lack of time. The respondents were able to select up to three reasons; 24% answered that completing the trip would have required too much energy, so they did not bother. Another reason given by 24% percent of the respondents was that they either did not have to, or did not feel like, making the trip anyway. These answers indicate that mental resources and emotions affect travel decisions. Also, 18 percent of the respondents said that they did not travel because they had responsibilities at home. This supports the conclusion discussed with the specialists that other needs may take importance over travel needs. Fewer than 5% of the respondents reported not making a trip due to lack of a suitable vehicle or travelling being too expensive. These shares differ from the results of the constraints analyses, where lack of money or lack of a suitable vehicle were experienced as restrictive more often. A reason for this could be that the respondents do not even make plans for trips that are too expensive or beyond their reach. Thus, more temporal reasons, like issues related to time, energy, needs or mood, stand out in this question. In addition, probably not all unrealised trips are consciously considered. It must be acknowledged that both the requirements of travel and the

requirements of the activity to which one is travelling may affect the constraints experienced. That is to say, it might be that the respondents would have had time for travelling to participate in an activity, but the activity itself would have required too much time, for example.

Constraints of daily mobility are relevant from an individual's point of view, but they are relevant from the transport point of view as well. The experienced constraints may indicate changes in mobility if the transport environment and ways of travel change. It has been noted that as transport vehicles have become faster, people have started to travel further and trip lengths have increased. This is expected to be true also in the future.

5.5. Mental resources have a remarkable impact on mobility

Low energy or inability to cope was the factor most commonly experienced as mobility restricting, when the respondents were asked about their daily mobility constraints. As many as 82% of the respondents said that it restricts their daily mobility at least slightly, and 34% experienced it as a quite or very restrictive mobility constraint.

The result showed that the mental resources required to make an effort to travel are a relevant issue in mobility. The results support the suggestions by Norros (2004) that dynamism, complexity and uncertainty of the environment require skill, knowledge and collaboration. However, it is good to note that not only travel but also activities to which people travel require energy. Distinguishing between these two can be difficult. Even if these kinds of subjectively experienced mental resources are hard to concretise and study, striving towards a better understanding of them is essential. The findings suggest that changes in the requirements of personal resources in travel can change realised travel. For example, if travelling becomes easier and more comfortable, less mental effort is required, which can lead to an increased amount of travel and change the travel patterns of individuals. This can also be applied to other resources and constraints. Changes in the travel environment and available alternatives affect what is required from one to travel. Considering individuals' experiences, resources and constraints can therefore not only increase our knowledge of today's travel but help to predict future travel as well. This kind of information could be useful, since it has been stated that the development of automated features in cars or travel applications can shape travel behaviour by reducing the cognitive or physical effort required

in travelling (Shaheen et al. 2016; van Arem et al. 2016; Offer 2015; Korbel et al. 2013). The impacts of new technology on the use and value of time have been discussed (Lyons & Urry 2005), but the value of effortless and stress-free travel and its impact on travel behaviour are highly relevant issues as well.

The survey results showed that people experience the pleasantness of travel modes differently. Although further and wider research on pleasantness experiences needs to be done, the divergent pleasantness experiences can have an effect on mobility. It has been shown that people have preferences for specific travel modes (Vij et al. 2013; Van Wee et al. 2002). Experience of pleasantness could be one motive for these mode preferences. It can also have an effect on travel decisions, for instance in terms of perception of opportunities. In other words, available travel alternatives are seen differently by individuals, and this is one reason why decisions are not always rational in terms of time and money optimisation. Experiencing pleasantness affects trip quality in terms of user stress and feeling of comfort. Thus, pleasantness influences how much is required mentally from an individual to travel. This relates to personal resources, including not only time and money but physical abilities and mental resources as well, and to willingness to use them in order to travel.

5.6. Scientific implications

This work has generated implications of value to science. The most salient ones are discussed briefly here.

The mobility model introduced in this work identifies the most relevant known factors related to mobility as potential for travel. The broadness of the concept has been recognised before, but it has not typically been noticed in practice. The model helps in bringing more obscure factors of mobility into research design, transport planning and policy making.

The results of this work indicate that mental resources and constraints related to them affect daily mobility besides traditionally identified resources and constraints related to money, time, availability of transport modes, safety and physical disabilities. When we understand that actual travel takes place within the travel potential, the future impacts of changes in the transport environment or services can be estimated more accurately by taking the constraints restricting the travel potential into account. Information and understanding of

mobility constraints can be used in designing research, constructing models, assessing the impacts of future changes, or building of scenarios, for example.

Information concerning preferences and priorities related to travel helps in understanding and predicting human travel. Although more research is clearly needed, the results show that separate travel features offered by travel modes can be specified and their importance to individuals can be asked. Going beyond traditional travel modes to considering these kinds of features made it possible to identify in more detail what features specifically respond to people's preferences and needs. In addition, information about how individual experiences, for example in the case of experiencing pleasantness, differ from each other may explain, for its part, why people have preferences for certain travel modes. When daily travel experiences and personal decision-making in travel are understood better, it is easier to plan transport services and manage the mobility demand.

5.7. Needs for future research

Besides bringing a greater understanding of mobility, this work revealed multiple needs for future research. First, since the work points out that travel experiences, preferences, personal resources and constraints affect mobility, more empirical research is needed to dig deeper into these issues. For example, interviews without defined response alternatives could be very useful in finding out more perspectives. There is a need to study personal resources more deeply. The prioritisation between different needs and in the use of finite resources to fulfil them is unclear. In particular, there seems to be a need to study obscure but relevant mental resources and their role in travel and mobility. In addition, implementation of the concepts of mobility in established transport planning and policy practices should be considered.

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Appendix 1. Survey questions.

KOKEMUKSELLINEN LIIKKUMISTUTKIMUS [SURVEY OF TRAVEL EXPERIENCES]

Note to the reader: the online appearance of the questionnaire differs from the one here.

Johdanto [Introduction]:

Useimmille eri paikkojen välillä liikkuminen on olennainen osa arkea. Silti sitä on tutkittu verrattain vähän tavallisten ihmisten kokemusten kautta. On olemassa paljon tietoa ihmisten liikkumisrutiineista, mutta vähän ihmisten kokemuksista matkojen takana.
Tässä kyselyssä kysytään kysymyksiä arkisiin tavallisiin matkoihisi liittyen. Pääasiallisena tarkoituksena on ymmärtää liikkumiseen liittyviä kokemuksiasi, tarpeitasi, mieltymyksiäsi ja rajoitteitasi.
Vastaamalla annat arvokasta tietoa tutkimuskäyttöön liikkumisen ymmärtämisen ja liikenteen kehittämisen puolesta. Kyselyssä kerättäviä tietoja ei yhdistetä yksittäiseen vastaajaan. Toivottavasti vastaaminen on Sinulle miellyttävää.

[For most people, travelling between places is a relevant part of everyday life. It has been studied quite little from the perspective of individual travel experiences. There is a lot of information about people's travel patterns, but not much about the experiences behind the trips.
In this survey, you will be asked questions concerning your ordinary travel. The purpose is to understand your travel experiences, needs, preferences and constraints.
By answering, you will contribute valuable information to research promoting the understanding of travel and development of transport. Hopefully, you will find responding to the questions a pleasant experience.]

Taustakysymykset [Background]

1. Asuinpaikan postinumero [Postal code]

2. Onko taloudessanne auto? [Do you have car in your household?]

3. Onko sinulla voimassa oleva [Do you have a valid]
   Ajokortti [Driving licence] (Kyllä/Ei) [(Yes/No)]
   Joukkoliikenteen kausikortti tai ladattu arvokortti [Public transport seasonal or value card]
   (Kyllä/Ei) [(Yes/No)]

4. Onko sinulla mahdollisuus tavanomaisilla matkoillasi käyttää [On ordinary trips, do you have the possibility to use]
   - Autoa (kuljettajana) [Car as a driver] (Kyllä/Ei) [(Yes/No)]
   - Autoa (kyydittävänä) [Car as a passenger] (Kyllä/Ei) [(Yes/No)]
   - Polkupyörää [Bicycle] (Kyllä/Ei) [(Yes/No)]
   - Bussia [Bus] (Kyllä/Ei) [(Yes/No)]
   - Junaa [Train] (Kyllä/Ei) [(Yes/No)]
   - Raitiovaunua [Tram] (Kyllä/Ei) [(Yes/No)]
   - Metroa [Metro] (Kyllä/Ei) [(Yes/No)]

5. Kuinka usein käytät seuraavia kulkuvälineitä? (Vastaa erikseen kesä- ja talvikauden osalta) [How often do you use the following travel modes? (Please respond separately for summer and winter seasons)]

   Touko–lokakuussa [May–October]:
   - Autoa (kuljettajana) [Car as a driver] (Päivittäin tai lähes päivittäin/viikoittain/kuukausittain/harvoin tai en ollenkaan) [(Daily or almost daily/weekly/monthly/rarely or never)]
   - Autoa (kyydittävänä) [Car as a passenger] (Päivittäin tai lähes päivittäin/viikoittain/kuukausittain/harvoin tai en ollenkaan) [(Daily or almost daily/weekly/monthly/rarely or never)]
   - Joukkoliikennettä [Public transport] (Päivittäin tai lähes päivittäin/viikoittain/kuukausittain/harvoin tai en ollenkaan) [(Daily or almost daily/weekly/monthly/rarely or never)]
   - Polkupyörää [Bicycle] (Päivittäin tai lähes päivittäin/viikoittain/kuukausittain/harvoin tai en ollenkaan) [(Daily or almost daily/weekly/monthly/rarely or never)]

   Marras–huhtikuussa [November–April]:
   - Autoa (kuljettajana) [Car as a driver] (Päivittäin tai lähes päivittäin/viikoittain/kuukausittain/harvoin tai en ollenkaan) [(Daily or almost daily/weekly/monthly/rarely or never)]
   - Autoa (kyydittävänä) [Car as a passenger] (Päivittäin tai lähes päivittäin/viikoittain/kuukausittain/harvoin tai en ollenkaan) [(Daily or almost daily/weekly/monthly/rarely or never)]
   - Joukkoliikennettä [Public transport] (Päivittäin tai lähes päivittäin/viikoittain/kuukausittain/harvoin tai en ollenkaan) [(Daily or almost daily/weekly/monthly/rarely or never)]
   - Polkupyörää [Bicycle] (Päivittäin tai lähes päivittäin/viikoittain/kuukausittain/harvoin tai en ollenkaan) [(Daily or almost daily/weekly/monthly/rarely or never)]

6. Onko sinulla arkimatkojen tekemiseen vaikuttavia liikkumisrajoitteita (esim. vammaa tai sairautta)? [Do you have any physical disabilities that affect daily travel (e.g. disability or condition?] (Kyllä/Ei) [(Yes/No)]

   Jos kyllä, mitä? [If yes, what?] _____

7. Kuinka tyytyväinen olet joukkoliikenneyhteyksiin kaupungissasi yleisesti? [How satisfied are you with the public transport connections in your city generally?] (Asteikolla 1=Erittäin tyytymätön – 5=Erittäin tyytyväinen + En osaa sanoa) [(1=Very displeased – 5=Very pleased + I can't say)]

8. Kuinka tyytyväinen olet joukkoliikenneyhteyksiin tavanomaisilla matkoillasi? [How satisfied are you with the public transport connections on your ordinary trips?] (Asteikolla 1=Erittäin tyytymätön – 5=Erittäin tyytyväinen + En osaa sanoa) [(1=Very displeased – 5=Very pleased + I can't say)]

9. Kuinka miellyttäväksi yleensä koet matkustamisen seuraavilla kulkutavoilla? [How pleasant do you usually find travelling with the following modes?] (Asteikolla 1=Erittäin

epämiellyttävä – 7=Erittäin miellyttävä + En osaa sanoa tai ei ole tuttu. ”Mahdollinen tarkennus” -avoin kenttä) [(1=Very unpleasant – 7=Very pleasant + I can’t say, or mode not familiar. Feel free to elaborate in the available space]

- Auto [Car]
- Bussi [Bus]
- Juna [Train]
- Polkupyörä (kesäkautena) [Bicycle (summer season)]
- Polkupyörä (talvikautena) [Bicycle (winter season)]
- Kävely [Walking]
- Metro [Metro]
- Raitiovaunu [Tram]
- Jaettu taksi [Shared taxi]

10. (Vain niille, joilla on taloudessa auto) [(Answer only if you have a car in your household)] Kuinka monta ajokilometriä omalla/taloutenne autolla kertyy vuodessa? [How many kilometres is your car driven per year?]

11. (Vain niille, joilla on taloudessa auto) [(Answer only if you have a car in your household)] Kuinka suureksi suunnilleen arvioisit käyttämäsi auton vuosikustannukset? Pyri huomioimaan mukaan kaikki kustannukset, kuten polttoainekulut, vakuutukset, huolto ja auton arvon alenema. [Please estimate the total annual costs of your car, including petrol, insurance, maintenance and decline in selling value] (summa euroissa tai ’en osaa sanoa’) [(amount in euros or ’I can’t say’)]

12. Kuinka paljon keskimäärin käytät rahaa joukkoliikenteen matkoihin kuukaudessa? [How much on average do you spend on public transportation per month?] (summa euroissa tai ’en osaa sanoa’) [(amount in euros or ‘I can’t say’)]

Arjen liikkuminen [Daily travel]

13. Kuinka kaukana kotoasi seuraavat paikat sijaitsevat? [How far from your home are the following places?] (Alle 1 km/1–5 km/6–10 km/11–16 km/Yli 16 km/En yleensä käy täällä. ”Tarkenna halutessasi” -avoin kenttä) [Under 1 km/1–5 km/6–10 km/11–16 km/Over 16 km/I don’t usually visit this place. Possibility to elaborate below]
    - Työ- tai opiskelupaikkani [My place of work or study]
    - Useimmin käyttämäni ruokakauppa [Most often used grocery store]
    - Muu ostospaikka (esim. vaate- ja elektroniikkaostokset) [Other shopping place (for e.g. clothes or electronics)]
    - Posti- ja apteekkipalvelut tms. asiointipaikka [Postal services, pharmacy or other service]
    - Paikka, jossa useimmin harrastan [Place where I participate in leisure activities most often]
    - Lasteni hoito- tai koulupaikka [My children’s daycare or school]
    - Muu usein vierailemani paikka, mikä? [Other often visited place, what?]

14. Millä kulkutavalla useimmiten käyt arkena seuraavissa paikoissa? (Voit tarvittaessa valita useamman vaihtoehdon) [What transportation mode do you generally use to visit the following places? (You may choose several) (Autolla/Julkisella liikenteellä/Polkupyörällä/Kävellen (koko matka)/Muulla kulkutavalla/ En yleensä käy täällä. Mahdollinen tarkennus (esim. vuodenaikainen vaihtelu) avoin kenttä)

[(Car/Public transport/Bicycle/Walking (whole trip)/Other/Place not usually visited. Possibility to elaborate below]

- Työ- tai opiskelupaikkani [My place of work or study]
- Useimmin käyttämäni ruokakauppa [Most often used grocery store]
- Muu ostospaikka (esim. vaate- ja elektroniikkaostokset) [Other shopping place (for e.g. clothes or electronics)]
- Posti- ja apteekkipalvelut tms. asiointipaikka [Postal services, pharmacy or other service]
- Paikka, jossa useimmin harrastan [Place where I participate in leisure activities most often]
- Lasteni hoito- tai koulupaikka [My children's daycare or school]
- Muu usein vierailemani paikka, mikä? [Other often visited place, what?]

15. Käytätkö yleensä samalla matkalla aina samaa kulkutapaa vai valitsetko kulkutavan erikseen tilanteen mukaan? [Do you usually use the same travel mode for the same type of trip, or do you choose the mode each time depending on the situation?] (Käytän aina samaa/Valitsen tilanteen mukaan/En osaa sanoa) [(Always use the same/Choose depending on the situation/I can't say)]

16. (Asked if responded 'choose depending on the situation' in Q15) Mistä seikoista valinta riippuu? [What affects your situation-specific mode decisions?]

17. Kuinka usein kuljetat lapsia/kuljet lasten kanssa? [How often do you travel with children?] (Joka päivä/Useita kertoja viikossa/Useita kertoja kuussa/Harvemmin tai en lainkaan) [(Daily/Many times a week/Many times a month/Rarely or never)]

18. Valitse itsellesi tyypillinen arkipäivä. Mitä teet tuon kyseisen päivän aikana kuhunkin kellonaikaan? [Choose a typical weekday. What do you do doing during that day at different times?] (Nukun/Töissä tai opinnoissa/Liikun paikasta toiseen/Säännöllinen harrastus tai velvollisuus/Teen vaihtelevia asioita) [(Sleep/At work or study/Travel/Regular leisure activity or responsibility/Varying activities)
    - 00–01
    - 01–02
    - 02–03
    - 03–04
    - 04–05
    - 05–06
    - 06–07
    - 07–08
    - 08–09
    - 09–10
    - 10–11
    - 11–12
    - 12–13
    - 13–14
    - 14–15
    - 15–16
    - 16–17
    - 17–18
    - 18–19

- 19–20
- 20–21
- 21–22
- 22–23
- 23–00

Arjen liikkumisen rajoitteet [Daily travel constraints]

Jokainen kohtaa arjessaan tilanteita, jolloin kaikkea aiottua tai haluttua ei ole mahdollista toteuttaa. Esimerkiksi käytettävissä olevan ajan, rahan ja jaksamisen rajallisuus pakottaa meitä priorisoimaan toimintaamme, myös eri paikkoihin menemistä. Saatamme aikoa käydä ystävän luona tai ostoksilla, mutta jätämmekin syystä tai toisesta menemättä. Tässä osiossa kysytään matkoista, joita ei ajatuksesta tai aikomuksesta huolimatta lopulta toteuteta.

[There are situations in everyday life when it is not possible to do everything that was planned or desired. For example, limited money, time and energy/coping forces us to make compromises, also concerning going places. We might plan to visit a friend or go shopping, but then skip it for some reason or other.
This part of the survey asks about trips that were considered but not put into practice.]

19. Koska viimeksi ajattelit arjessasi käydä jossain, minne et lopulta mennytkään? [When was the last time you considered going somewhere but did not go?]
    - Tänään [Today]
    - Tällä viikolla [This week]
    - Tässä kuussa [This month]
    - Käyn aina missä aion [I always go where I intend to go]
    - En muista [Cannot remember]

20. (If the response to Q19 is 'today', this week' or 'this month') Missä olisit käynyt ja mitä varten? [Where did you consider going and why?]

21. Mikä seuraavista kuvaa parhaiten syytä, jonka vuoksi jätit tämän matkan tekemättä (valitse 1–3 vaihtoehtoa)? [Which of the following best describes the reason you chose not to go (choose 1–3 options)?]
    - Liikkuminen on turhan kallista [Travelling was too expensive]
    - Minulla ei ollut aikaa [I didn't have enough time]
    - Minulla oli velvollisuuksia kotona [I had duties at home]
    - Liikkuminen olisi vaatinut liikaa energiaa (en jaksanut) [Travelling would have demanded too much energy]
    - Minulle sopivaa kulkuvälinettä ei ollut saatavilla [There was no suitable travel mode]
    - Minun ei sittenkään tarvinnut tai tehnyt mieli mennä kyseiseen paikkaan [Eventually I felt I didn't need to or want to go to that location]
    - Pystyin hoitamaan asian kätevämmin (esimerkiksi netissä tai puhelimella) [There was an easier way to see to my task (for example online)]
    - Joku toinen hoiti asian puolestani [Somebody else took care of the task for me]
    - Siirsin matkaa toiseen ajankohtaan [I postponed the trip to another time]

- Muu syy, mikä? [Other reason, what?]

22. Haluaisitko arkielämässäsi liikkua nykyistä enemmän paikasta toiseen? [Would you prefer travelling more from one place to another in your daily life?]
    - Haluaisin liikkua enemmän [I would like to travel more]
    - Olen tyytyväinen nykytilanteeseen [I am content as it is]
    - Haluaisin liikkua vähemmän [I would like to travel less]
    - En osaa sanoa [I can't say]

23. Millaisia matkoja jätät arjessasi tekemättä olosuhteiden pakosta? [What kinds of trips are you forced to skip in your daily life?]

24. Kuinka paljon seuraavat tekijät rajoittavat arkista matkustamistasi? [How much do the following factors restrain travel in your daily life? (Asteikolla 1=Ei lainkaan – 7=Erittäin paljon + En osaa sanoa) [(1=Not at all – 7=Very much + I can't say)]
    - Ajan puute [Lack of time]
    - Rahan puute [Lack of money]
    - Jaksamisen puute [Lack of energy]
    - Turvallisuustekijät [Safety issues]
    - Sopivan kulkuneuvon puute [Lack of a suitable vehicle]
    - Fyysiset liikkumisrajoitteet [Physical disabilities]
    - Jokin muu, mikä? _____ [Something else, what?]

Liikkumisen prioriteetit [Priorities in traveling]

25. (Only for those who go to work or study) Kuinka tärkeitä seuraavat tekijät ovat matkustaessasi töihin/opiskelupaikkaan? Merkitse lopuksi kolme tärkeintä tekijää numeroin 1=tärkein, 2=toiseksi tärkein, 3=kolmanneksi tärkein. (Asteikolla 1=Ei lainkaan tärkeää – 9=Erittäin tärkeää + En osaa sanoa) [How important are the following factors for your trips to work/study? Finally, choose the three most important factors on a scale of 1=most important 2=second most important 3=third most important. (1=not at all important 9=very important)]
    - Matkustamiseen ei kulu paljon rahaa [Travelling doesn't require much money]
    - Matkustan nopeimmalla tavalla [I travel by the fastest means possible]
    - Minun ei tarvitse seurata liikennevälineiden aikatauluja [I am not bound to transport timetables]
    - Matkan ympäristöystävällisyys [Environmentally-friendly travel]
    - Saan ajaa itse [I get to drive myself]
    - Mahdollisimman pieni kävelyn määrä [As little walking as possible]
    - Kätevä tavaratila, jotta minun ei tarvitse kantaa tavaraa [Practical boot space so I don't have to carry goods]
    - Oma henkilökohtainen tila matkustaessa (ei vieraita samassa kulkuvälineessä) [Personal space when traveling (not having to share with strangers)]
    - Voin keskittyä muuhun kuin ajamiseen matkan aikana [I can focus on other things than driving during the trip]
    - Voin kuljettaa kätevästi lapsia mukana [I can easily transport children]

- Kulkutavan luotettavuus [Reliability of travel mode]
- Reitti on turvallinen [The route is safe]
- Reitti on miellyttävä [The route is pleasant]
- Saan hyötyliikuntaa samalla [I get to exercise while travelling]
- En joudu olemaan ulkona huonossa säässä [I don't have to be outside in bad weather]
- Kulkuvälineiden vaihtojen määrä [Number of changes between vehicles]

26. Kuinka tärkeitä seuraavat tekijät ovat matkustaessasi ruokaostoksille? Merkitse lopuksi kolme tärkeintä tekijää numeroin 1=tärkein, 2=toiseksi tärkein, 3=kolmanneksi tärkein. (Valinnat asteikolla 1=Ei lainkaan tärkeää – 9=Erittäin tärkeää + En osaa sanoa) (Asteikolla 1=Ei lainkaan tärkeää – 9=Erittäin tärkeää + En osaa sanoa) [How important are the following factors for your trips to the grocery store?] [Finally, choose the three most important factors on a scale of 1=most important 2=second most important 3=third most important. (1=not at all important 9=very important)]
    - Matkustamiseen ei kulu paljon rahaa [Travelling doesn't require much money]
    - Matkustan nopeimmalla tavalla [I travel by the fastest means possible]
    - Minun ei tarvitse seurata liikennevälineiden aikatauluja [I am not bound to transport timetables]
    - Matkan ympäristöystävällisyys [Environmentally-friendly travel]
    - Saan ajaa itse [I get to drive myself]
    - Mahdollisimman pieni kävelyn määrä [As little walking as possible]
    - Kätevä tavaratila, jotta minun ei tarvitse kantaa tavaraa [Practical boot space so I don't have to carry goods]
    - Oma henkilökohtainen tila matkustaessa (ei vieraita samassa kulkuvälineessä) [Personal space when travelling (not having to share with strangers)]
    - Voin keskittyä muuhun kuin ajamiseen matkan aikana [I can focus on other things than driving during the trip]
    - Voin kuljettaa kätevästi lapsia mukana [I can easily transport children]
    - Kulkutavan luotettavuus [Reliability of travel mode]
    - Reitti on turvallinen [The route is safe]
    - Reitti on miellyttävä [The route is pleasant]
    - Saan hyötyliikuntaa samalla [I get to exercise while travelling]
    - En joudu olemaan ulkona huonossa säässä [I don't have to be outside in bad weather]
    - Kulkuvälineiden vaihtojen määrä [Number of changes between vehicles]

27. Kuinka tärkeitä seuraavat tekijät ovat matkustaessasi harrastuspaikkaan? Merkitse lopuksi kolme tärkeintä tekijää numeroin 1=tärkein, 2=toiseksi tärkein, 3=kolmanneksi tärkein. (Valinnat asteikolla 1=Ei lainkaan tärkeää – 9=Erittäin tärkeää + En osaa sanoa) (Asteikolla 1=Ei lainkaan tärkeää – 9=Erittäin tärkeää + En osaa sanoa) [How important are the following factors for your trips to your leisure activity? Finally, choose the three most important factors on a scale of 1=most important 2=second most important 3=third most important. (1=not at all important 9=very important)]
    - Matkustamiseen ei kulu paljon rahaa [Travelling doesn't require much money]
    - Matkustan nopeimmalla tavalla [I travel by the fastest means possible]

- Minun ei tarvitse seurata liikennevälineiden aikatauluja [I am not bound to transport timetables]
- Matkan ympäristöystävällisyys [Environmentally-friendly travel]
- Saan ajaa itse [I get to drive myself]
- Mahdollisimman pieni kävelyn määrä [As little walking as possible]
- Kätevä tavaratila, jotta minun ei tarvitse kantaa tavaraa [Practical boot space so I don't have to carry goods]
- Oma henkilökohtainen tila matkustaessa (ei vieraita samassa kulkuvälineessä) [Personal space when traveling (not having to share with strangers)]
- Voin keskittyä muuhun kuin ajamiseen matkan aikana [I can focus on other things than driving during the trip]
- Voin kuljettaa kätevästi lapsia mukana [I can transport children practically]
- Kulkutavan luotettavuus [Reliability of travel mode]
- Reitti on turvallinen [The route is safe]
- Reitti on miellyttävä [The route is pleasant]
- Saan hyötyliikuntaa samalla [I get to exercise while travelling]
- En joudu olemaan ulkona huonossa säässä [I don't have to be outside in bad weather]
- Kulkuvälineiden vaihtojen määrä [Number of changes between vehicles]

Kuvitteelliset matkavalinnat [Imaginary travel choices]

Kuvittele jokin arkipäivänä tapahtuva matka (esimerkiksi asiointi, vierailu, tapaaminen tai harrastukseen meno), joka on noin 6 kilometriä suuntaansa, mutta ei ole työ- tai koulumatkasi.
[Imagine some specific ordinary trip in your daily life (e.g. visiting places, meeting someone or going to a leisure activity)]

28. Minkä matkan valitsit: minne menet ja mitä tekemään? [What trip will you choose: where are you going and for what purpose?)

29. Kuvaile valitsemaasi matkaa: pitävätkö seuraavat väittämät paikkansa matkasi kohdalla? [Describe the trip you chose: are the following true or not?] (Kyllä/Ei) [(Yes/No)]
    - Minun on oltava paikalla täsmällisesti tiettyyn aikaan [I have to be there at a specific time]
    - Minulla on painavaa kannettavaa mukanani mennessä tai tullessa [I have heavy belongings with me]
    - Olen menossa paikkaan suoraan jostain muualta kuin kotoa [I am going there directly from some other place than home]
    - Matkustan yksin [I am travelling alone]
    - Perillä on tarjolla varma parkkipaikka autolle [There is a guaranteed parking space at the destination]
    - Perillä on tarjolla ilmainen parkkipaikka autolle [There is free parking at the destination]

Kuvittele, että sinulla olisi matkan toteuttamiseen kolme mahdollista kulkutapaa, joiden väliltä voit valita itsellesi sopivimman vaihtoehdon. Kuviteltu valintatilanne ei välttämättä

vastaa todellista tilannettasi, mutta vastaa kuvitellen, että sinulla on annetut vaihtoehdot. Voit myös olla valitsematta niistä mitään.

Seuraavaksi esitetään tällainen kuvitteellinen valintatilanne neljä kertaa. Valitse matkasi toteuttamiseen sopivin vaihtoehto.

[Imagine that you have three alternative travel modes with which to complete the trip you just envisaged. The situation may not correspond to your real life, but imagine that you have all these options available. You may also choose none.
Below, you are given four scenarios. Pick the most suitable option for your trip.]

(Huomio: Valintatilanteita on 8 erilaista, joista yhdelle vastaajalle esitetään neljä) [(Note: There are 8 situations/choices, but only 4 are presented to one respondent)]

VALINTATILANNE 1 [CHOICE 1]

- JULKINEN LIIKENNE [PUBLIC TRANSPORT]:
  kokonaismatka-aika 15 min [door-to-door travel time 15 min]
  lipun hinta 2€ [ticket price 2€]
- AUTO [CAR]:
  matkustusaika 20 min [travel time 20 min]
  kustannukset omalla autollasi [car expenses]
- POLKUPYÖRÄ [BICYCLE]:
  matka-aika riippuu nopeudestasi [travel time depends on your speed]
  oletuksena on hyvä keli [weather is good]
- EI MIKÄÄN [NONE]:
  Jättäisin menemättä
  näillä vaihtoehdoilla [I would rather not use any of these options]

VALINTATILANNE 2 [CHOICE 2]

- JULKINEN LIIKENNE [PUBLIC TRANSPORT]:
  kokonaismatka-aika 15 min [door-to-door travel time 15 min]
  lipun hinta 2€ [ticket price 4€]
- AUTO [CAR]:
  matkustusaika 20 min [travel time 20 min]
  kustannukset omalla autollasi [car expenses]
- POLKUPYÖRÄ [BICYCLE]:
  matka-aika riippuu nopeudestasi [travel time depends on your speed]
  oletuksena on hyvä keli [weather is good]
- EI MIKÄÄN [NONE]:
  Jättäisin menemättä
  näillä vaihtoehdoilla [I would rather not use any of these options]

VALINTATILANNE 3 [CHOICE 3]

- JULKINEN LIIKENNE [PUBLIC TRANSPORT]:
  kokonaismatka-aika 30 min [door-to-door travel time 30 min]
  lipun hinta 2€ [ticket price 2€]
- AUTO [CAR]:
  matkustusaika 20 min [travel time 20 min]
  kustannukset omalla autollasi [car expenses]

- POLKUPYÖRÄ [BICYCLE]:
  matka-aika riippuu nopeudestasi [travel time depends on your speed]
  oletuksena on hyvä keli [weather is good]
- EI MIKÄÄN [NONE]:
  Jättäisin menemättä
  näillä vaihtoehdoilla [I would rather use any of these options]

VALINTATILANNE 4 [CHOICE 4]

- JULKINEN LIIKENNE [PUBLIC TRANSPORT]:
  kokonaismatka-aika 30 min [door-to-door travel time 30 min]
  lipun hinta 4€ [ticket price 4€]
- AUTO [CAR]:
  matkustusaika 20 min [travel time 20 min]
  kustannukset omalla autollasi [car expenses]
- POLKUPYÖRÄ [BICYCLE]:
  matka-aika riippuu nopeudestasi [travel time depends on your speed]
  oletuksena on hyvä keli [weather is good]
- EI MIKÄÄN [NONE]:
  Jättäisin menemättä
  näillä vaihtoehdoilla [I would rather not use any of these options]

VALINTATILANNE A [CHOICE A]

- JULKINEN LIIKENNE [PUBLIC TRANSPORT]:
  kokonaismatka-aika 15 min [door-to-door travel time 15 min]
  lipun hinta 2€ [ticket price 2€]
- AUTO [CAR]:
  matkustusaika 10 min [travel time 10 min]
  kustannukset omalla autollasi [car expenses]
- POLKUPYÖRÄ [BICYCLE]:
  matka-aika riippuu nopeudestasi [travel time depends on your speed]
  oletuksena on hyvä keli [weather is good]
- EI MIKÄÄN [NONE]:
  Jättäisin menemättä
  näillä vaihtoehdoilla [I would rather not use any of these options]

VALINTATILANNE B [CHOICE B]

- JULKINEN LIIKENNE [PUBLIC TRANSPORT]:
  kokonaismatka-aika 15 min [door-to-door travel time 15 min]
  lipun hinta 4€ [ticket price 4€]
- AUTO [CAR]:
  matkustusaika 10 min [travel time 10 min]
  kustannukset omalla autollasi [car expenses]
- POLKUPYÖRÄ [BICYCLE]:
  matka-aika riippuu nopeudestasi [travel time depends on your speed]
  oletuksena on hyvä keli [weather is good]
- EI MIKÄÄN [NONE]:
  Jättäisin menemättä
  näillä vaihtoehdoilla [I would rather not use any of these options]

VALINTATILANNE C [CHOICE C]

- JULKINEN LIIKENNE [PUBLIC TRANSPORT]:
  kokonaismatka-aika 30 min [door-to-door travel time 30 min]
  lipun hinta 2€ [ticket price 2€]
- AUTO [CAR]:
  matkustusaika 10 min [travel time 10 min]
  kustannukset omalla autollasi [car expenses]
- POLKUPYÖRÄ [BICYCLE]:
  matka-aika riippuu nopeudestasi [travel time depends on your speed]
  oletuksena on hyvä keli [weather is good]
- EI MIKÄÄN [NONE]:
  Jättäisin menemättä
  näillä vaihtoehdoilla [I would rather not use any of these options]

VALINTATILANNE D

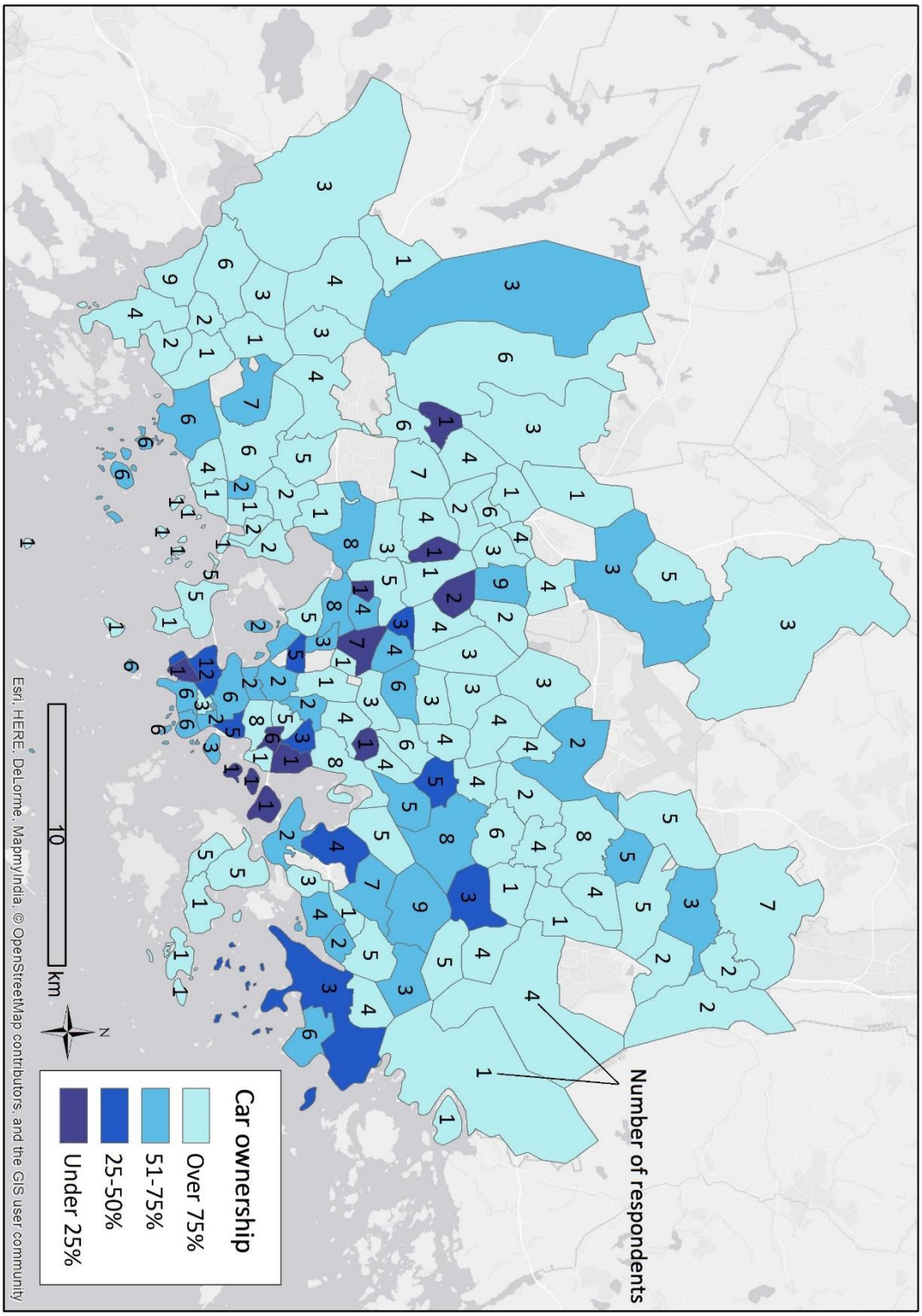
- JULKINEN LIIKENNE [PUBLIC TRANSPORT]:
  kokonaismatka-aika 30 min [door-to-door travel time 30 min]
  lipun hinta 4€ [ticket price 4€]
- AUTO [CAR]:
  matkustusaika 10 min [travel time 10 min]
  kustannukset omalla autollasi [car expenses]
- POLKUPYÖRÄ [BICYCLE]:
  matka-aika riippuu nopeudestasi [travel time depends on your speed]
  oletuksena on hyvä keli [weather is good]
- EI MIKÄÄN [NONE]:
  Jättäisin menemättä
  näillä vaihtoehdoilla [I would rather not use any of these options]

Kiitos vastauksistasi! [Thank you taking the time to answer!]

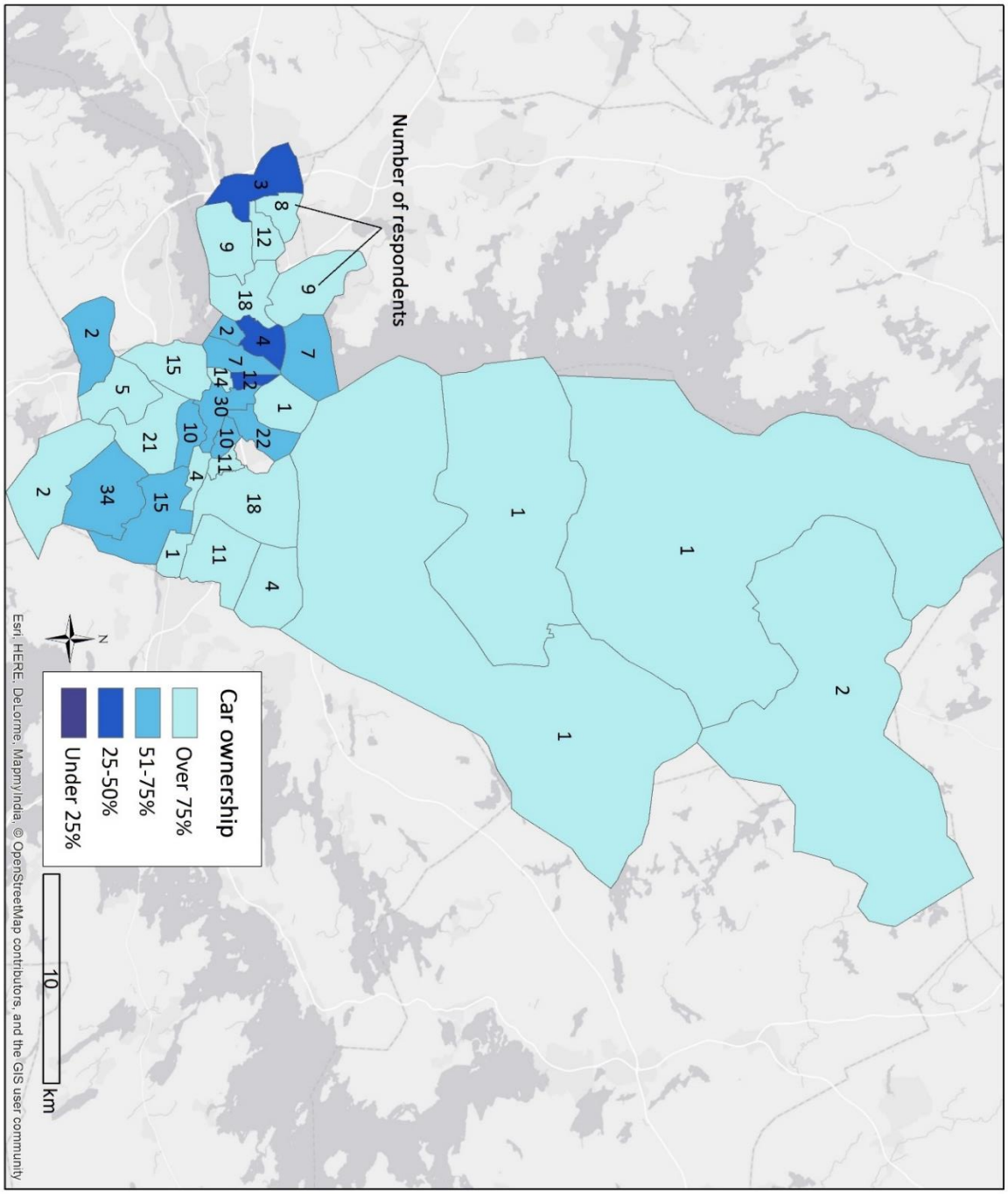
Voit lopuksi esittää kommentteja liittyen kyselyyn tai vastauksiisi [Finally, please feel free to share any further comments concerning your answers or the survey]

Appendix 2. Distribution of the respondents and their car ownership by postal code area in the Capital Region, Tampere and Turku

CAPITAL REGION



TAMPERE


Number of respondents
Car ownership
Over 75%
51-75%
25-50%
Under 25%
10
km
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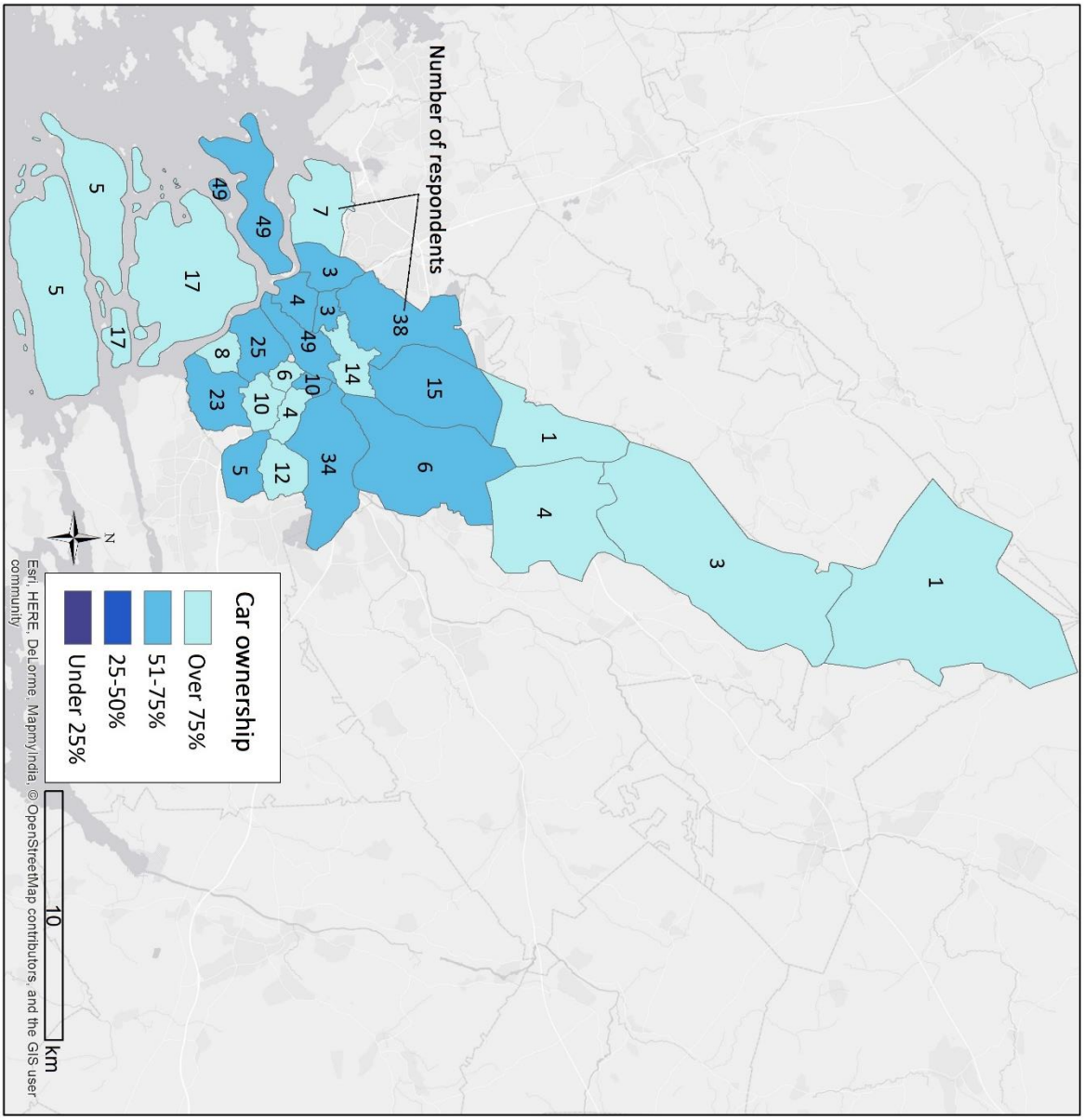
TURKU


Number of respondents
Car ownership
Over 75%
51-75%
25-50%
Under 25%
N
10
km
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